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NATIONAL CAPITAL REGION WATER AND WASTE MANAGEMENT REPORT

Environmental Protection Agency
Washington, D. C.

April 1971

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ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 30 1971

OFFICE OF THE
ADMINISTRATOR

Dear Mr. President:

This transmits the National Capital Region Water and Waste Management Report prepared by my staff, pursuant to Section 704 of the District of Columbia Revenue Act of 1970 (PL 91-650).

The report contains findings from special studies of problems in providing adequate water, sewerage, sanitation, and related services in the Washington metropolitan area. The report also includes conclusions and recommendations on these matters which address, as required by Section 704, the establishment of an appropriate independent area or regional entity to control and resolve such problems and to provide such services in a more effective manner.

Pursuant to the above Act, the Environmental Protection Agency has consulted with the Federal agencies specified in the Act and other jurisdictions in Maryland and Virginia. The report, as a result, reflects true region-wide cooperation and effort. EPA appreciates the invaluable assistance and support it has received from officials and staff of other Federal, State, interstate and local governmental units, although the views expressed in the report are not necessarily those of all such organizations involved.

These consultations and associated research efforts reaffirm the conclusion that there is a fragmentation of authority, responsibilities, and capabilities to cope with the major water and waste management problems in this Washington metropolitan area. The report points out the need for attacking these problems on a region-wide basis, and identifies a number of alternatives for doing this. I feel these alternatives merit serious consideration, and I believe the recommendations in the staff report would provide one organizational solution for dealing with water, sewer, sanitation and related services.

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The report also reveals, however, that there is a very close relationship between such services and other services necessary for the Washington metropolitan area and, indeed, a close relationship to the overall development of this area. The time allowed for preparation of this report has not been sufficient to permit development of firm recommendations which would adequately take into account the broader considerations involved. Final decisions on new organizational structure should reflect these broader considerations. Nevertheless, I feel the findings identified in the report require prompt attention. Towards this end, the Administration is reviewing the need for legislation to enable a regional solution to the water and waste management problems in the Washington metropolitan area.

I hope the attached report will lead to an awareness of the regional nature of these problems and also the need to strengthen region-wide institutions to cope with such problems.

Sincerely yours,

William D. Ruckelshaus

William D. Ruckelshaus
Administrator

Honorable Spiro T. Agnew
President of the Senate
United States Senate
Washington, D. C. 20510

Enclosure

ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 30 1971

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William D. Ruckelshaus

William D. Ruckelshaus
Administrator

Honorable Carl Albert
Speaker of the House of Representatives
Washington, D. C. 20515

Enclosure

PREFACE

A JOINT RESOLUTION OF THE CONGRESS IN 1960

To establish an objective for coordinating the development of the District of Columbia with the development of other areas in the Washington metropolitan region and the policy to be followed in the attainment thereof, and for other purposes.

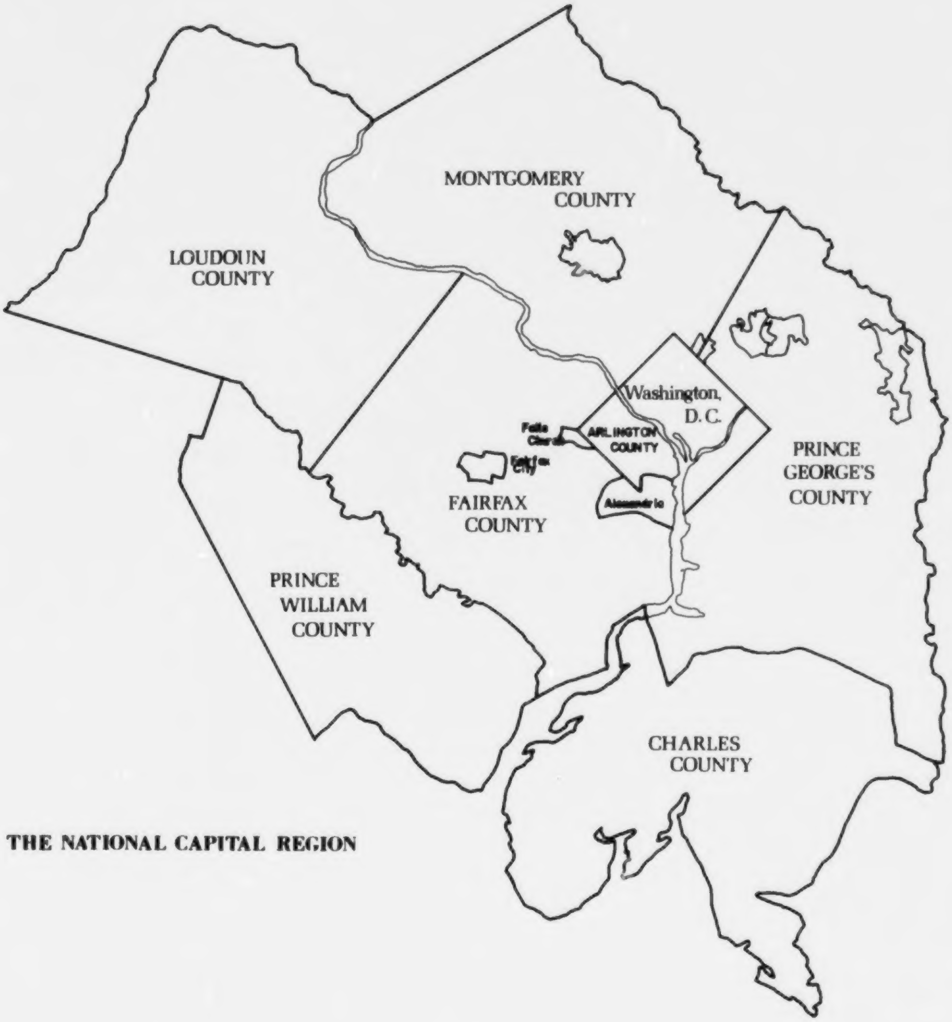
Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Washington Metropolitan Region Development Act".

Section.2.The Congress hereby declares that, because the District which is the seat of the Government of the United States and has now become the urban center of a rapidly expanding Washington metropolitan region, the necessity for the continued and effective performance of the functions of the Government of the United States at the seat of said Government in the District of Columbia, the general welfare of the District of Columbia and the health and living standards of the people residing or working therein and the conduct of industry, trade, and commerce therein require that the development of the District of Columbia and the management of its public affairs shall, to the fullest extent practicable be coordinated with the development of the other areas of the Washington metropolitan region and with the management of the public affairs of such other areas, and that the activities of all of the departments, agencies, and instrumentalities of the Federal Government which may be carried out in, or in relation to, the other areas of the Washington metropolitan region shall to the fullest extent practicable, be coordinated with the development of such other areas and with the management of their public affairs; all toward the end that, with the cooperation and assistance of the other areas of the Washington metropolitan region, all of the areas therein shall be so developed and the public affairs thereof shall be so managed as to contribute effectively toward the solution of the community development problems of the Washington metropolitan region on a unified metropolitan basis.

Sec.3.The Congress further declares that the policy to be followed for the attainment of the objective established by section 2 hereof and for the more effective exercise by the Congress, the executive branch of the Federal Government and the Board of Commissioners of the District of Columbia and all other officers and agencies and instrumentalities of the District of Columbia of their respective functions, powers, and duties in respect of the Washington metropolitan region, shall be that all such functions, powers, and duties shall be exercised and carried out in such manner as (with proper recognition of the sovereignty of the State of Maryland and the Commonwealth of Virginia in respect of those areas of the Washington metropolitan region as are situate within their respective jurisdictions) will best facilitate the attainment of such objective of the coordinated development of the areas of the Washington metropolitan region and coordinated management of their public affairs so as to contribute effectively to the solution of the community development problems of the Washington metropolitan region on a unified metropolitan basis.

Sec.4.The Congress further declares that, in carrying out the policy pursuant to section 3 hereof for the attainment of the objective established by section 2 hereof, priority should be given to the solution, on a unified metropolitan basis, of the problems of water supply, sewage disposal, and water pollution and transportation.

-- Excerpt from Public Law 86-527 enacted by the Congress and signed by the President on June 27, 1960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THE NATIONAL CAPITAL REGION

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ORGANIZATIONS AND INDIVIDUALS CONTRIBUTING

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Major General F. P. Koisch
Forrest O. Swiggart
Kenneth H. Murdock
Dan M. Watt, Chief, Washington Aqueduct Div.

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Robert B. Russ, Asst. to the Chief Engineer
George Nagle, Deputy Comptroller

PROJECT DIRECTION

Donald M. Mosiman, Assistant Administrator for Field Coordination, EPA
William M. Colony, WQO, EPA, Project Director
Marvin B. Fast, WQO, EPA, Assistant Project Director
Walter G. Gilbert, WQO, EPA, Assistant Project Director
Royal C. Thayer, WQO, EPA, Assistant Project Director

JOINT EPA-MWCOG STAFF TASK FORCE

Robert Ajax, APCO, EPA
Frank A. Bell, Jr., WQO, EPA
Leo J. Clark, WQO, EPA
Jerome J. Healey, WQO, EPA
Norbert A. Jaworski, WQO, EPA

Kenneth M. Karch, MWCOG
Fred Knapp, WQO, EPA
Alan S. Lessin, OGC, EPA
Eugene Mattis, WQO, EPA
Fred Meadows, APCO, EPA
P. Krishna Murthy, MWCOG

Lloyd H. Rooney, WQO, EPA
Charles Spooner, MWCOG
Bernard Stoll, SWO, EPA
Andrew R. Uricheck, WQO, EPA
Steven Wassersug, APCO, EPA

CONSULTANTS

Jerome M. Alper, Bernstein, Alper, Schoene, & Friedman
Robert R. Harris
Paul S. Hughes, Institute for Defense Analyses
James H. Pickford, Advisory Commission on Intergovernmental Relations

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CHAPTER I

AUTHORITY AND STUDY APPROACH

This Chapter states the authority for the study; delineates the scope of the study and report; discusses those agencies and organizations who participated in the study; and denotes meetings and discussions with individuals, groups, and organizations that were held during the course of the study and the development of this report.

A. AUTHORITY

The conduct of this study was directed by the Congress in Section 704 of the District of Columbia Revenue Act of 1970 (PL 91-650). This section follows:

> "Sec. 704 (a) The Administrator of the Environmental Protection Agency, in consultation with the Secretary of the Interior, the Chief of Engineers of the Corps of Engineers of the United States Army, and the Commissioner of the District of Columbia, shall conduct a special study of and make recommendations with respect to--
>
> (1) the water pollution problems of the part of the Potomac River that is located within the Washington metropolitan area,
>
> (2) the water resources of the Potomac River for such area,
>
> (3) the problems relating to the provision of adequate facilities for water, sewer, sanitation, and related services for such area, and
>
> (4) the establishment of an appropriate independent area or regional entity to control and resolve such water pollution problems, to regulate and control such water resources, and to provide such services at reasonable costs.
>
> The study shall contain specific recommendations as to the extent and amount of funding that would be necessary to establish and maintain such an area or regional entity, recommendations as to any functions now performed by Federal and District

of Columbia entities which should be transferred to such an area or regional entity, and recommendations as to provisions for protection of employees of entities that would be affected by such transfers.

(b) The Administrator of the Environmental Protection Agency shall report to the Congress the results of the study under subsection (a), together with his recommendations, on or before March 31, 1971."

Further Congressional directives are contained in the Conference Committee Report (House Report No. 91-1789) which states that:

> "It is expected that the Administrator in carrying out such study and formulating his recommendations will consult with appropriate public officials of the jurisdictions in Maryland and Virginia which will be affected by his recommendations."

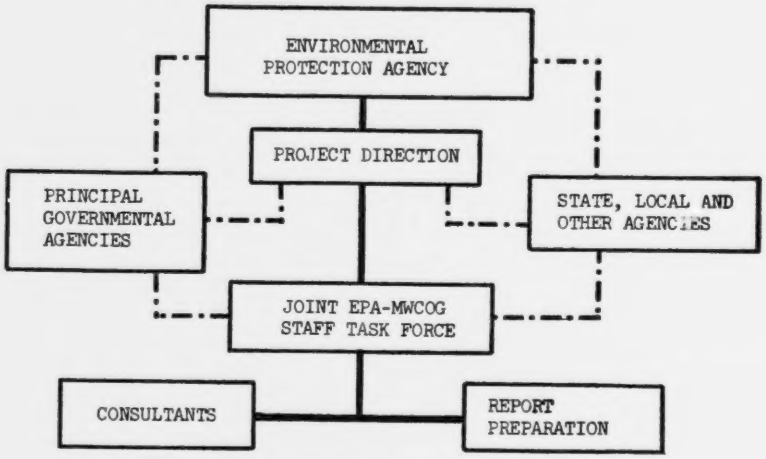
B. PARTICIPANTS AND CONTRIBUTORS

Primary responsibility for coordination of the study investigations and preparation of the report was assigned by the Administrator of the Environmental Protection Agency, William D. Ruckelshaus, to the Assistant Administrator for Field Coordination, Donald M. Mosiman. As Project Director, William M. Colony of the Water Quality Office, EPA, was responsible for coordinating the joint staff effort and that of many individuals representing Federal, State, interstate and local jurisdictions and agencies participating in the study and contributing to the preparation of the data for the report.

A Joint Environmental Protection Agency--Metropolitan Washington Council of Governments Staff Task Force was formed to facilitate collection and evaluation of data, and the preparation of preliminary drafts of the conclusions of the study investigations. In addition, EPA utilized the services of individuals from the Advisory Commission on Intergovernmental Relations, the Institute for Defense Analyses and other consultants from both inside and outside of government. Through direct contacts and discussions with many officials, including administrative and operational staff members of State and local jurisdictions and agencies, large amounts of data, informative comments and constructive criticism were obtained. Those participants and contributors, whose invaluable assistance made the preparation of this report possible in a short time, are acknowledged elsewhere in this document.

The conclusions and recommendations contained in this report are those of the Environmental Protection Agency and have been developed in consultation with appropriate officials of the governmental jurisdictions and agencies in accordance with the directive contained in the legislation and the intent of the Congress.

ORGANIZATION FOR THE NATIONAL CAPITAL REGION
WATER AND WASTE MANAGEMENT REPORT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PRINCIPAL GOVERNMENTAL AGENCIES
STATE, LOCAL AND OTHER AGENCIES
JOINT EPA-MWCOG STAFF TASK FORCE
CONSULTANTS
REPORT PREPARATION

C. SCOPE OF STUDY AND REPORT

In accordance with the authorizing legislation, the study and this report present a review of existing information, on-going programs, consideration of institutional and financial alternatives and recommendations as to creation of new institutions and provisions of more effective fiscal arrangements. The investigations for this report were carried to a point where significant conclusions and reasonable recommendations could be made in response to the legislative mandate.

Prior reports and other documents were reviewed and utilized to delineate the scope of the study investigations, as well as to serve as the basic framework within which to arrive at conclusions and recommendations. These reports and documents, including proceedings of the Potomac Enforcement Conference, and technical reports of the various Federal, State, interstate, and local governmental units, are listed in the bibliography to be found at the end of the report.

D. MEETINGS AND DISCUSSIONS

One basic premise upon which the study and the development of the report rests is involvement of officials and staff members of many representative agencies and organizations in the process of carrying out this assignment. Staff of the joint EPA-COG Task Force and others met with representatives of governmental units and agencies on numerous occasions to obtain their assistance and reactions. In addition, the first draft of the report was discussed at two informal meetings on March 10 and 11 for critique of the preliminary conclusions and recommendations.

Participants at the March 10 meeting included chief administrative officials and staff members from affected jurisdictions of the National Capital Region. Invited participants at the March 11 meeting included elected officials of the jurisdictions of the Region and their staffs. Subsequently, the second draft of this report was submitted to interested jurisdictions and agencies for further comment before preparation of the final draft and formal review prior to publication.

CHAPTER II

CONCLUSIONS AND RECOMMENDATIONS

1. The people of the National Capital Region now face, or soon will face, serious water supply and environmental protection problems, some possibly of a critical nature, identified as follows:

a. The National Capital Region is faced with the possibility of an immediate water supply shortage extending from one to several days if drought flows, such as those experienced in 1930, 1966, and 1969, recur in the Potomac River. With increasing usage, and without remedial action, the potential shortages would become more severe and by 2010-20 could extend beyond a period of five months.

b. Under any flow conditions, the Region would be faced with an immediate water supply crisis in the event of an accidental spill of toxic materials into the Potomac River sufficiently severe to require the shutdown of the four existing water intakes located on the river. Shutdowns greater than one day would cause serious problems in meeting the water supply demands of the Region.

c. Current plans do not provide for the development of alternative sources of water supply, such as offstream raw or finished water storage, which would adequately protect the Region in the event of either short-term water shortages or toxic spill emergencies.

d. While several plans have been proposed for meeting the long range water supply needs of the Region, none have been adopted or found to be completely acceptable to the jurisdictions of the area.

e. There are no adequate interconnections between the distribution systems of the major suppliers which can assure continuance of water supply in an emergency affecting one or more suppliers.

f. Current water quality problems in the Potomac River are high bacterial densities, low dissolved oxygen concentrations, and nuisance algae growths affecting over 58 miles of the upper Potomac estuary. These problems are due mainly to the lack of adequate wastewater treatment facilities. Overflows of raw sewage due to incomplete portions of the Upper Potomac Interceptor Relief Sewer, combined sewer overflows from the District of Columbia and the City of Alexandria, and urban storm water runoff also are significant sources of water quality degradation.

g. While considerable effort and investment have been expended to treat the wastewaters of the Region, the ever increasing volumes of wastewater, caused by an expanding population and an increasing per capita use of water, have caused increases in the amounts of oxygen-demanding material and nutrients being discharged to the Potomac.

h. Based on population projections and engineering studies, there are needs both for a 40 percent expansion in wastewater treatment capacity to handle the additional flows expected in the next 10 years and a need to upgrade the degree of treatment, utilizing the latest technology for advanced wastewater treatment.

i. Urban runoff from the storm drainage systems of the metropolitan area contributes to the pollution of the Potomac River. Recent studies indicate that bacterial, oxygen-demanding organic loadings, and total solids contents of storm water discharges significantly degrade water quality during and after heavy storms. None of the local jurisdictions involved has developed substantive plans for dealing with the problems associated with this source of water pollution.

j. The operation of advanced waste treatment processes, together with increased sewage volumes, will produce by 1980 a sixfold increase in the volume of sewage sludge solids. There is presently no adequate regionwide plan for disposing of these large volumes of solid waste.

k. The production of all solid wastes in the Region will double by 1980-85. The selection of disposal sites and other means for disposal have presented difficult problems during recent years. These problems will become more severe unless effective regional planning, followed by a coordinated implementation program, is initiated in the near future.

l. Air pollution has been a serious problem in the National Capital Region for more than a decade and, in the absence of adequate control measures, prolonged smog episodes such as occurred in 1959 would likely recur. The Region lacks a planning agency capable of effectively integrating, on an areawide basis, air pollution controls over land uses and automotive traffic which will be required to implement air quality standards being established pursuant to the 1970 amendments to the Clean Air Act.

2. Failure to act now to solve these problems will only aggravate their critical nature and add to the financial cost of their ultimate solutions.

3. Major obstacles to adequate solutions to these problems are institutional and financial rather than technical or engineering.

4. State and local governments in the National Capital Region have significantly reduced the adverse effects of fragmentation of governmental organization and authority for water supply and waste management through commendable joint planning in the Metropolitan Washington Council of Governments (MWCOG), use of sub-regional agencies for water supply and waste management in major sub-areas within the Region, and use of intergovernmental agreements. However, the critical nature of present or imminent environmental problems and the need for Federal intervention, especially in the form of enforcement actions to protect environmental quality, dramatically demonstrate the Region's failure to correct four major weaknesses:

   a. The tendency, until recently, to underestimate or ignore ecological and environmental impacts of waste management decisions and the continuing reluctance to recognize relationships between land use and other development policies, on the one hand, and established environmental quality goals, on the other.

   b. The lack of authority in the existing regional comprehensive planning agency (MWCOG) to achieve adherence to regional priorities and plans.

   c. The separation of water supply and waste management programs and the multiplicity of locally-oriented agencies for providing such services.

   d. Uncertain, low priority, and generally inadequate arrangements to provide the funds which will be required between now and 1980 for the construction of new facilities for water supply and waste management and for the upgrading and enlargement of present facilities.

5. A major issue in creating new institutional arrangements to correct these weaknesses is the question of the level of government (local, State, or Federal) at which these arrangements should be established and controlled.

6. Correction of the Region's present institutional and financial weaknesses can best be achieved through establishment of

the following organizational structure at the level of local government and created by interstate compact:

a. A new regional body (identified in this report as the Regional Council) for comprehensive planning and for policy decisions in water supply and waste management affecting the entire region or more than a single community.

b. A new areawide governmental corporation (identified in this report as the Environmental Service Corporation) for the acquisition, construction and operation of wholesale facilities for water supply and waste management within the Region.

By strengthening the governing of this metropolitan area through the adoption of the dual institutional structure recommended in this report, the National Capital Region would become a highly visible model for the restructuring of local government in other metropolitan areas in the Nation. In so doing, the Region's action also would point the way toward the development of new regional institutions in these areas which can assure achievement of the President's goal in the New Federalism of returning decision-making power to State and local governments.

7. The Regional Council would assume and continue the regionwide planning function now performed by the Metropolitan Washington Council of Governments, which would go out of existence after phasing its operations and resources into those of the Regional Council. The new Regional Council would differ from the present Council of Governments in four important features: (a) the Regional Council's statutory foundation through an interstate compact; (b) under the two favored methods for organizing the Council, its responsiveness and accountability to the people of the Region through popular election of all or a majority of its members directly to the Council; (c) the requirement that the Council must hold public hearings before adopting the comprehensive development guide for the National Capital Region which it would be expected to prepare and adopt; and (d) its ability, through the adoption of the comprehensive development guide, to serve as the vehicle for regional policy decisions.

As recommended in this report, these policy decisions would be controlling over water supply and waste management programs. This authority of the Council could be extended, of course, so that such policy decisions would be controlling also in other service or resource management programs. Such extension could be accomplished either at the time the compact would go into effect or later, if subsequently approved by the compacting parties.

Plans and policy decisions for the National Capital Region developed and adopted by the Council would be expected to conform to policies and requirements applicable to the National Capital Region established by the Federal Government and Maryland and/or Virginia. It also would be expected that the Council's plans and policy decisions would be developed in consonance with policies of the Interstate Commission on the Potomac River Basin or its successor agency.

The report recommends that the Council be composed of members elected directly to the Council rather than by representation of each constituent governmental jurisdiction through an official elected to public office in that jurisdiction. It also is recommended that the Council's policy decisions be adopted by application of the one man, one vote principle.

8. The Environmental Services Corporation would be established by the Regional Council and would function under its supervision. By assuming responsibility for regional wholesale facilities for water supply and waste management, the Corporation would permit the Regional Council to integrate waste management programs and to effectively coordinate these with water supply and other service or resource management programs.

Upon approval of the Council, the Corporation would assume ownership of regional wholesale facilities for water supply and waste management. A description of facilities tentatively included in the regional system is given in Chapter VI. The Environmental Protection Agency stresses the tentative nature of the regional system as described herein, because it firmly believes the people of the Region, as represented in the Regional Council, should determine the exact composition of the regional system. The estimated cost of acquiring or constructing this tentative regional system through 1980 is in the range of $1.1 to $1.27 billion.

Current costs of the Corporation, defined as costs of operation, maintenance, and debt amortization and interest payments to be paid during a given year, and costs of acquisition and improvement of the regional system to be paid during that year from funds other than borrowing, would be allocated among the governments served by the Corporation generally on the basis of the use made of the Corporation s services. This allocation would be modified by factors such as capacity reserved for future use, the benefits resulting to the entire metropolitan area from a particular component in the system, and deferment of payments for capacity reserved but not yet used to prevent inequities in the allocation of current costs.

The basis for acquisition of the existing facilities from the current owner would be:

a. In the case of facilities under construction or improvement at the time of acquisition, the assumption or payment of the facility's outstanding debt for such construction or improvement.

b. In the case of other facilities, assumption or payment of the outstanding debt but also the granting to the jurisdiction owning the facility of a credit based on the current value of the facility (taking into consideration such factors as Federal or state construction grants, the outstanding debt assumed by the Corporation, depreciation, and changes in price levels). This credit would be applicable against future costs allocated to that jurisdiction by the Corporation.

Specific provisions governing both the takeover of facilities and the allocation of current costs would be detailed in the compact empowering the Regional Council to establish the Corporation. The compact also would provide for the protection of employees of local facilities taken over by the Corporation.

9. Significant benefits which this dual structure would provide to citizens of the National Capital Region include:

a. Greater assurance of an adequate water supply and improved environmental quality.

b. Probable financial savings because of economies of scale which would be realized (1) in borrowing funds for capital improvements, (2) in the construction of such improvements, and (3) in the operation of facilities.

c. Improved ability by the Region's governments, through the sharing of costs, to utilize emerging technology for recycling solid wastes, the cost of which is likely to exceed the individual funding capability of most jurisdictions.

d. Resolution of controversial issues, which now require difficult policy decisions by individual local governments, within the framework of an areawide perspective responsive to the needs of the entire Region.

e. Relief from pressures created by existing debt limitations on individual jurisdictions.

f. An organization authorized to represent the National Capital Region and present its needs and coordinated position in basin water resources management programs and in other state and Federal programs affecting the development of the metropolitan area.

g. Establishment of a regional institution which could be assigned oversight responsibilities in other service or resource management areas which in the future may demand regionwide organization and policies.

10. Although less satisfactory, two alternative possibilities could achieve some improvement in the Region's present institutional arrangements for water supply and waste management. The first of these is a Federally established corporation which would take over and operate the wholesale facilities of the Corps of Engineers, the District of Columbia Department of Sanitary Engineering, and other similar facilities in the Region, either with the concurrence of the jurisdiction now operating the facility or through the exercise of a Congressionally conferred power of eminent domain. The other alternative is the continued, but strengthened, use of the present combination of sub-regional organization and intergovernmental contractual arrangements.

11. It is recommended that establishment of the Regional Council and Environmental Services Corporation be encouraged and facilitated by appropriate Congressional or Executive action which would:

a. Grant advance consent for the negotiation of an interstate compact creating the Council and authorizing it to establish the Corporation.

b. Indicate that, when the Regional Council has completed arrangements for the Corporation to assume responsibility for the operation of the regional system, the Washington Aqueduct of the Corps of Engineers and the District of Columbia Water Pollution Control Plant and other wholesale facilities of the District of Columbia Department of Sanitary Engineering would be transferred to the Environmental Services Corporation. Such transfer should be contingent upon the Council authorizing the Corporation to take over and operate comparable regional facilities of other affected communities. Legislative or executive action effecting these transfers should also provide appropriate protection of the equities which the District and suburban jurisdictionshave acquired in these facilities and of the rights and benefits of employees affected by the transfer.

c. Assure that Federal agencies (1) with plans for the construction of facilities or acquisition of lands within the National Capital Region would consult with the Regional Council in the preparation of such plans, and (2) would consult with the Regional Council before awarding Federal planning or construction grants or other assistance for any project within the Region.

12. It is recommended that the Governors of Maryland and Virginia and the Mayor-Commissioner of the District of Columbia, in cooperation with local authorities, assume the initiative in drafting the recommended interstate compact to create the Regional Council and authorizing establishment of the Environmental Services Corporation.

13. The Environmental Protection Agency concludes, and emphasizes, that any actions of the Congress or the States and local jurisdictions to implement the recommendations of this report should be carefully developed so as not to delay activities to protect the environment to which the governments and others in the Region presently are committed under applicable water and air quality standards, the 1970 Memorandum of Understanding in the Potomac River Enforcement Conference, and any other applicable orders of Federal and State regulatory agencies.

CHAPTER III

WATER AND WASTEWATER MANAGEMENT PROBLEMS IN THE NATIONAL CAPITAL REGION

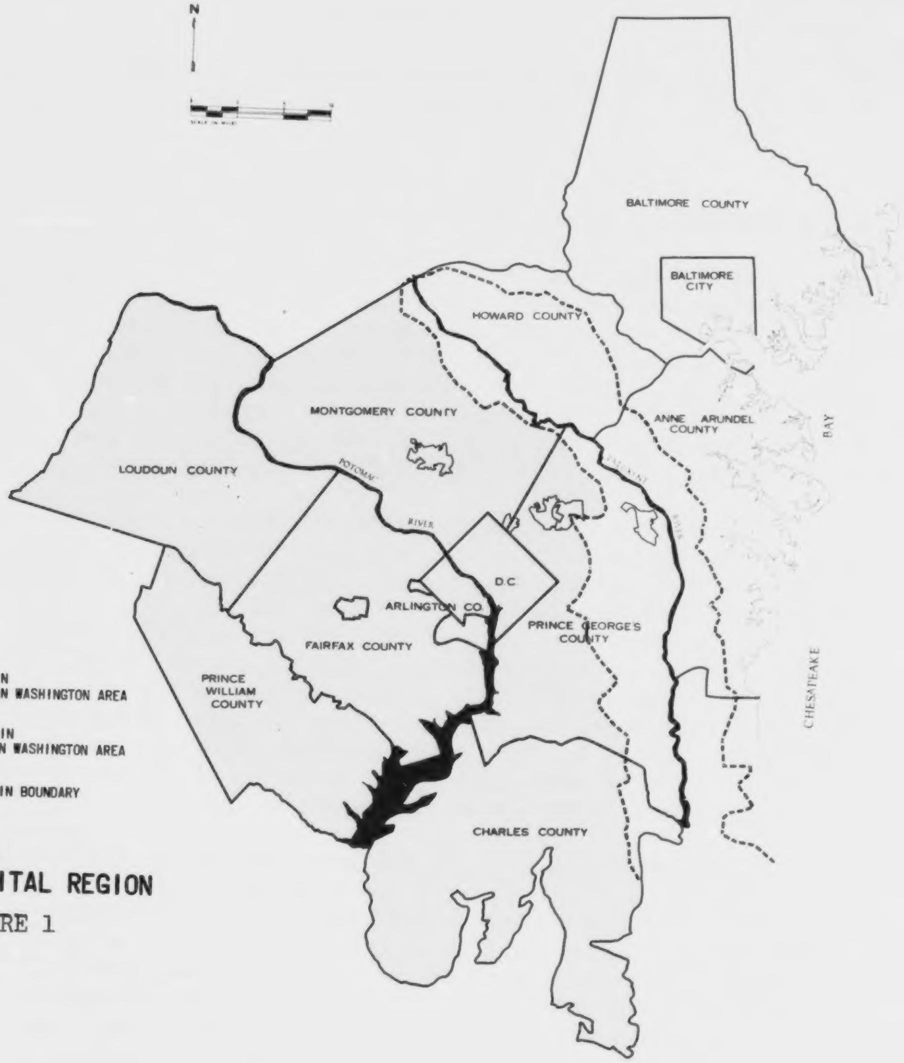
A. A DESCRIPTION OF THE NATIONAL CAPITAL REGION

The National Capital Region (Figure 1) covers some 2,810 square miles and measures about 72 miles wide and 76 miles long. It is situated at the estuarial base of one of the major rivers on the eastern seaboard-the Potomac River. The region covered in this study includes the District of Columbia; Montgomery, Prince Georges, and Charles Counties in Maryland; and Loudoun, Fairfax, Arlington, and Prince William Counties and the cities of Alexandria, Fairfax, and Falls Church in Virginia.

Two major river systems drain the Region. The Potomac River flows 385 miles from the Allegheny Mountains to the Chesapeake Bay. Within the region, the Potomac drains approximately 2072 square miles (88 percent of the region's land area). This area represents only 14 percent of the Potomac's total drainage basin but houses about 67 percent of the basin's population. The Patuxent River, the eastern boundary of the Maryland tricounty area, has headwaters in upper Montgomery County and extends to the Chesapeake Bay. The Patuxent drains an 896 square mile area, 278 square miles of which are within this Region. The river basins are shown in Figure 1.

The National Capital Region has been one of the fastest growing areas in the Nation for the past 30 years, with a substantial portion of this growth taking place in the decade of the 1960's. Starting from a population base of slightly more than 2 million persons in 1960, the area had grown to 2.8 million people by 1970. This represents an increase of 800,000 people in the decade, or 211 people every day. The area's economy expanded at a rapid rate; construction proceeded at a brisk pace and the new jobs created each year exceeded the rate of population growth. Total personal income increased dramatically, rising 137 percent to over 13.8 billion dollars. Average per capita income increased from $2,700 to an estimated $4,000. These growth rates were among the highest of those for all metropolitan areas in the United States during this period.

While the decade of the 1960's brought desirable opportunities to the Washington area, it also revealed problems which spanned a broad range of physical, social, economic, and environmental concerns. In this past decade, over 50,000 acres of


N
SCALE IN MILES
BALTIMORE COUNTY
BALTIMORE CITY
HOWARD COUNTY
MONTGOMERY COUNTY
ANNE ARUNDEL COUNTY
LOUDOUN COUNTY
POTOMAC RIVER
PATUXENT RIVER
D.C.
ARLINGTON CO.
FAIRFAX COUNTY
PRINCE GEORGE'S COUNTY
PRINCE WILLIAM COUNTY
CHARLES COUNTY
CHESAPEAKE BAY
POTOMAC RIVER BASIN WITHIN METROPOLITAN WASHINGTON AREA
PATUXENT RIVER BASIN WITHIN METROPOLITAN WASHINGTON AREA
PATUXENT RIVER BASIN BOUNDARY

RIVER BASINS
NATIONAL CAPITAL REGION

FIGURE 1

vacant land have been converted to urban uses for homes, schools, shopping centers, churches, and hospitals. New utilities, water lines, sewerage systems, and transportation facilities were provided, along with such amenities as parks and other recreational areas. Accompanying these physical facilities, additional governmental services such as police and fire protection were required. Many of these items share three common characteristics: (a) public responsibilities; (b) relatively permanent installations; and (c) high cost.

The Metropolitan Washington Council of Governments (MWCOG) has adopted population growth figures based on extensive demographic studies. The adopted growth projections are for 4.1 million people in 1980, 5.5 million in 1990, and 6.8 million in the year 2000. The rate of growth shown by these projections is higher than that experienced previously in the area.

B. THE ENVIRONMENTAL CRISIS

Existing Environmental Problems

Water Pollution

From the year 1870, when the first sewers and culverts were constructed, to the year 1938, almost all sewage from the Washington Metropolitan Area was discharged untreated into the Potomac Estuary. In 1938, a primary treatment plant was completed for the District of Columbia. Additional wastewater treatment facilities, including secondary treatment, were constructed in a belated attempt to cope with the influx of people into the area after World War II.

There are currently 28 wastewater treatment facilities in the region, 19 of which discharge to the upper estuary and serve approximately 2.7 million people. Presented in Table 1 are the current flows and loadings of these plants. Presented in Figure 2 are the existing service areas of the major facilities. The largest facility is the District of Columbia's Water Pollution Control Plant at Blue Plains which serves approximately 1.7 million people.

Since the first sanitary survey was made in 1913,water quality analyses of the Upper Potomac Estuary within the Washington Metropolitan Area have shown it to be continuously degraded by discharges of either untreated or partially treated municipal sewage. The current water quality problems can be best classified by subdivision of the upper estuary into four reaches according to type and source of pollution, as follows and as shown in Figure 3:

Reach	Miles of River Affected	Major Type of Pollution	Major Source of Pollution
Chain Bridge to Hains Point	7	Periodically High Bacterial Counts	Combined Sewer Overflows
Hains Point to Piscataway Creek	10	Low Dissolved Oxygen Concentrations	Effluent from Wastewater Treatment Facilities
Piscataway Creek to Maryland Point	30	Nuisance Algal Growths	Nutrients in Wastewater Discharges
Anacostia Tidal River	8	High Bacterial Counts and Low Dissolved Oxygen Concentrations	Combined Sewer Overflows

TABLE 1
Wastewater Loadings Discharged
To The Upper Potomac Estuary and Tributaries
Great Falls to Indian Head
January 1971

Facility	Population Served	Flow (mgd)	BOD5 (lbs/day)
Arlington	247,000	19.390	5,460
Pentagon	10,600*	1.060	360
Dry Weather Sewer Overflows D.C. System	18,300**	2.516	3,740
Naval Laboratory White Oaks, Md.	950*	0.095	7
District of Columbia	1,730,000	251.660	103,800
Alexandria	190,000	23.300	13,000
Fairfax-Westgate	124,400	11.570	10,900
Piscataway, WSSC	55,000	5.810	540
Andrews AFB No. 1	8,200*	0.820	110
Andrews AFB No. 2	860*	0.086	16
Naval Comm. Station Cheltenham, Md.	670*	0.067	15
Fairfax-Hunting Cr.	25,000	3.260	1,390
Fairfax-Dogue Cr.	20,000	2.441	915
Fort Belvoir No. 1	3,600	0.600	120
Fort Belvoir No. 2	18,400	2.340	380
Fairfax-Lower Potomac	100,000	10.000	1,500
Naval Ordnance Station Indian Head, Md.			
Site I	2,500*	0.250	90
Site II	3,600*	0.360	140
Site III	60*	0.006	1
Site IV	10	0.001	1
TOTAL	2,659,150	335.632	142,485

* Based on 100 gcpd

** Based on 1% of total load to wastewater facility

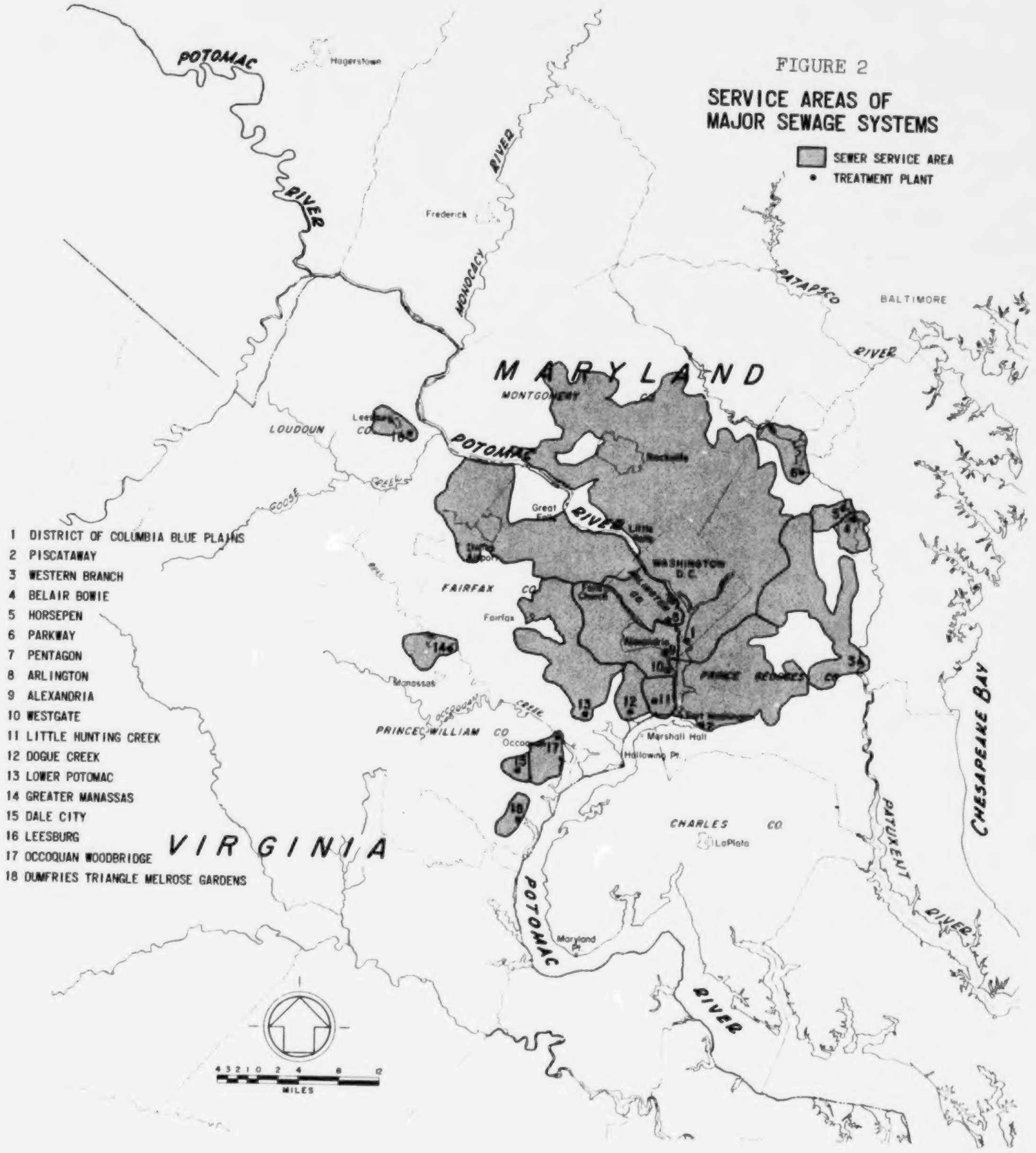
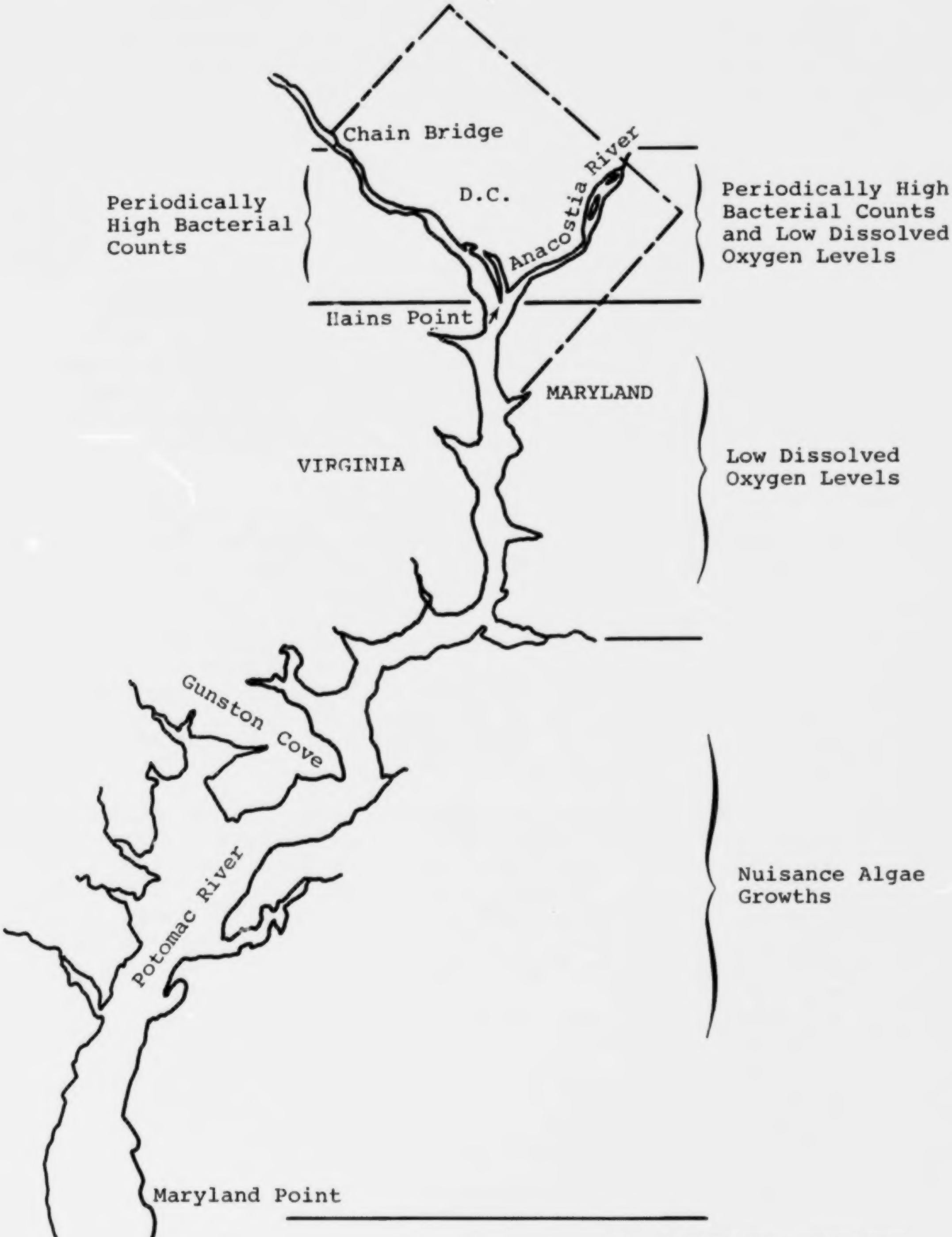


FIGURE 2

SERVICE AREAS OF MAJOR SEWAGE SYSTEMS

▨ SEWER SERVICE AREA
● TREATMENT PLANT
1 DISTRICT OF COLUMBIA BLUE PLAINS
2 PISCATAWAY
3 WESTERN BRANCH
4 BELAIR BOWIE
5 HORSEPEN
6 PARKWAY
7 PENTAGON
8 ARLINGTON
9 ALEXANDRIA
10 WESTGATE
11 LITTLE HUNTING CREEK
12 DOGUE CREEK
13 LOWER POTOMAC
14 GREATER MANASSAS
15 DALE CITY
16 LEESBURG
17 OCCOQUAN WOODBRIDGE
18 DUMFRIES TRIANGLE MELROSE GARDENS
POTOMAC RIVER
Hagerstown
MONOCACY RIVER
Frederick
PATAPSCO RIVER
BALTIMORE
MARYLAND
MONTGOMERY CO
Rockville
Leesburg
LOUDOUN CO
GOOSE CREEK
BULL RUN
Great Falls
WASHINGTON D.C.
FAIRFAX CO
Fairfax
Manassas
OCCOQUAN CREEK
PRINCE WILLIAM CO
Occoquan
PRINCE GEORGES CO
Marshall Hall
Hallowing Pt.
CHARLES CO
LaPlata
PATUXENT RIVER
CHESAPEAKE BAY
VIRGINIA
Maryland Pt.
4 3 2 1 0 2 4 8 12
MILES


Chain Bridge
D.C.
Anacostia River
Periodically High Bacterial Counts
Periodically High Bacterial Counts and Low Dissolved Oxygen Levels
Hains Point
MARYLAND
VIRGINIA
Low Dissolved Oxygen Levels
Gunston Cove
Nuisance Algae Growths
Potomac River
Maryland Point
N

WATER QUALITY PROBLEMS
Upper Potomac Estuary

FIGURE 3

Recent studies of storm drainage systems in the District of Columbia indicate that significant bacterial, oxygen demanding organic loadings and total solids discharged are additional sources of water quality degradation during and after heavy rainfall.

The principal types of pollution are bacterial, low dissolved oxygen, and eutrophication as shown in the table on page III-4 and Figure 3, and sediment and debris.

(1) Bacterial Pollution

Prior to the summer of 1969, most wastewater treatment facility discharges did not receive continuous disinfection. Coliform bacterial densities of over 50,000 MPN/100 ml were experienced, at the time, in the area of Woodrow Wilson Bridge. The standard for coliform bacteria is 240 MPN/100 ml in these waters. Since the initiation of effective wastewater chlorination, coliform bacterial densities have been drastically reduced to less than 2,000 MPN/100 ml.

Currently, the major source of bacterial pollution in the Upper Estuary is from discharges of raw sewage near Theodore Roosevelt Island. The discharges are the result of inadequate sewers, specifically, the uncompleted section of about 3,000 feet (often called the Georgetown Gap) of the Upper Potomac Interceptor Relief Sewer. Completion of the interceptor needed to transport wastewater to the Blue Plains facility of the District of Columbia is delayed by the controversy regarding location and feasibility of the Three Sisters Bridge, since the construction of the bridge approach lanes will determine the final route of the interceptor.

Because of the problems related to the delay in completion of the Upper Potomac Interceptor, and to inadequate treatment capacities, additional connections to the Interceptor have not been allowed. As a result, it has not been possible to construct an adequate interceptor along Cabin John Creek (a Potomac tributary in Maryland), to relieve a presently overloaded sewer which is periodically discharging raw sewage into the creek. High bacterial densities have been regularly observed in this watershed below the raw sewage discharge. During high runoff periods, high densities of total coliform (over 5,000 MPN/100 ml) have been detected in the Upper Potomac Estuary including the Anacostia River. Storm water runoff, combined sewer overflows, and runoff from the upper basin during these periods, all contribute to the bacterial pollution problem.

(2) Dissolved Oxygen and Eutrophication

Since the early 1940's dissolved oxygen levels in the upper estuary have been decreasing except in the early 1960's, when a slight increase occurred after the Blue Plains facility had been expanded to include secondary treatment. At the present time dissolved oxygen levels in a 10-mile reach of the upper estuary in the vicinity of the wastewater discharges often fall below 2.0 mg/l during the summer months. Low dissolved oxygen levels also occur in the Anacostia tidal river under summer flow conditions as a result of combined sewer overflows. The water quality standard for average dissolved oxygen for these reaches is 5.0 mg/l.

The water quality of the main stem of the upper estuary has continued to deteriorate, even though higher percentages of removal of biochemical oxygen demand (BOD*) are being achieved by wastewater treatment facilities.

Associated with the increase in sewage flows has been a parallel increase in dense, nuisance algal growths in approximately 30 miles of the estuary, especially during the summer months. Studies have indicated that the increase in nuisance growths is directly related to the increase in nitrogen and phosphorus in the discharge from wastewater treatment facilities.

Large green mats of the algae develop during the months of June through October, creating objectionable odors, clogging marinas, covering beaches and shorelines, and in general, reducing the recreational potential of the estuary. At times, dissolved oxygen concentrations are reduced below adopted water quality standards by these dense nuisance growths. Currently, more oxygen demanding matter is added to the upper estuary by the algal cells (in their growth and decay process) than that contributed directly by the carbonaceous and nitrogenous oxygen demanding materials in the wastewater discharges.

(3) Sediment and Debris

During periods of high flow, large quantities of suspended sediment enter the estuary from the upper basin and from the Anacostia Valley. During these high-flow periods, suspended sediments cause the upper 10 to 20 miles of the estuary to become chocolate brown in color and aesthetically objectionable.

Also, during high-flow periods, large quantities of debris enter the estuary from the upper basin as well as from the metropolitan area. Debris from the upper basin is typically large logs, leaves, and miscellaneous trash. Debris from the metropolitan area, which not only enters the estuary from local streams but also from combined sewer overflows and storm sewers, is often comprised of garbage, paper, vegetable and fruit peelings, styrofoam cups, and other types of trash.

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*BOD is the biological or biochemical oxygen demand, i.e., the amount of oxygen in milligrams per liter required by organisms for the aerobic decomposition of organic matter present in water. BOD_5 is the biochemical oxygen demand exerted over a period of five days.

The effect of the increased silt and debris loading on the water quality of the upper estuary is not clearly defined. Most of the particulate organic matter carried into the estuary settles to the bottom and contributes to the benthic oxygen demand. The major effect of the silt and debris loadings is aesthetic. The recreational uses of the upper estuary are considerably curtailed at times as a result of the high volumes of silt and debris.

(4) Urgency of Immediate Problems

Previous sanitary bacteriological studies of the Potomac Estuary indicate that waters having high coliform densities also have higher incidences of pathogenic bacteria, such as Salmonella. Thus, a potential health hazard exists in the vicinity of Theodore Roosevelt Island as a result of periodic raw sewage discharges from both combined sewer overflows and the uncompleted Upper Potomac Interceptor.

The health aspects are especially significant as the estuary is a potential and viable emergency source of water supply for the Washington, D.C. area. The location of the proposed water supply intake is only 2.7 miles above Theodore Roosevelt Island. Since the Potomac Estuary is tidal and therefore transports wastes upstream as well as downstream, it is necessary to eliminate the overflows in this area to prevent direct contamination of the estuary if it is to be used as an emergency water supply source.

When the current degraded water quality conditions, with respect to dissolved oxygen and eutrophication, are considered with the projected increased wastewater flows (see tabulation which follows), the need for immediate upgrading and expansion of wastewater treatment facilities is seen to be very urgent.

Year	Projected Wastewater Flows (mgd)	Percent Increase over 1970
1970	335	
1980	475	40%
2000	860	160%
2020	1340	300%

In the Anacostia tidal river, the discharge of raw sewage, because of inadequate sanitary sewer capacity and combined sewer overflows, is causing both a health hazard and a low dissolved oxygen problem. Unless the combined sewer overflows are reduced substantially, the water quality standard for bacteria and dissolved oxygen cannot be met.

The immediacy of water quality control problems was vividly demonstrated in the spring of 1970 when the public health and water pollution control authorities in Maryland and Virginia found themselves forced to issue bans on new sewer connections due to gross water quality degradation. The bans were, in essence, building restrictions imposed because of the inadequacy of sewage treatment capabilities. Recently, some of the bans have been relaxed, conditional on assurances by local authorities that remedial actions would be taken. The actions of the Potomac River-Washington Metropolitan Area Enforcement Conference have emphasized this urgency.

Water Supply

On September 10, 1966, the minimum daily flow (before diversions) of the Potomac River at Washington fell to 388 mgd. On July 3, 1969, a record high volume of water was withdrawn from the Potomac River for water supply in the National Capital Region--388 mgd. The specter which water supply engineers have feared for many years had come perilously close. A relatively water rich region, the seat of the Nation's government, had and continues to be faced with a potential emergency water shortage situation.

Nearly every U. S. citizen has come to expect and assume the ready availability of safe water for domestic, commercial and other human purposes as well as to fight fires, serve industry, etc. The severe shortages, which are sure to occur by 1980-85 if corrective action is not taken, could reduce the amenities of bathing, use of sanitary facilities, car washing, etc.; lead to public health problems through loss of system pressure and back-siphonage of contamination into the treated water; and hinder water service for fighting fires.

Water for ninety-four percent of the population of the National Capital Region is provided by three major utilities; the Washington Aqueduct (serving D. C. and parts of Virginia), the Washington Suburban Sanitary Commission (serving Montgomery and Prince George's Counties), and the Fairfax County Water Authority. Currently, about three-fourths of the source of water is taken from the Potomac and one-fourth from Patuxent, Occoquan, and Goose Creek reservoirs and from wells; the current local sources are near the limit of their potential and future increases in water demand will have to be met by increasing withdrawals from the Potomac or from other nonlocal sources. Table 2 gives selected statistics on area public water systems. The service areas of the region are delineated in Figure 4 and identified in Table 3.

Average water demand for 1970 was 381 mgd and is projected to rise to 600 mgd by 1980-85 and 1500 mgd by 2010-2020. The average annual demand of 1,500 mgd by 2010-2020 is expected to be met with 125 mgd from local non-Potomac sources and 1375 mgd to be met by the Potomac River or other nonlocal sources. Review of available water

TABLE 2
SELECTED STATISTICS ON PUBLIC WATER SYSTEMS IN THE NATIONAL CAPITAL REGION, 1970

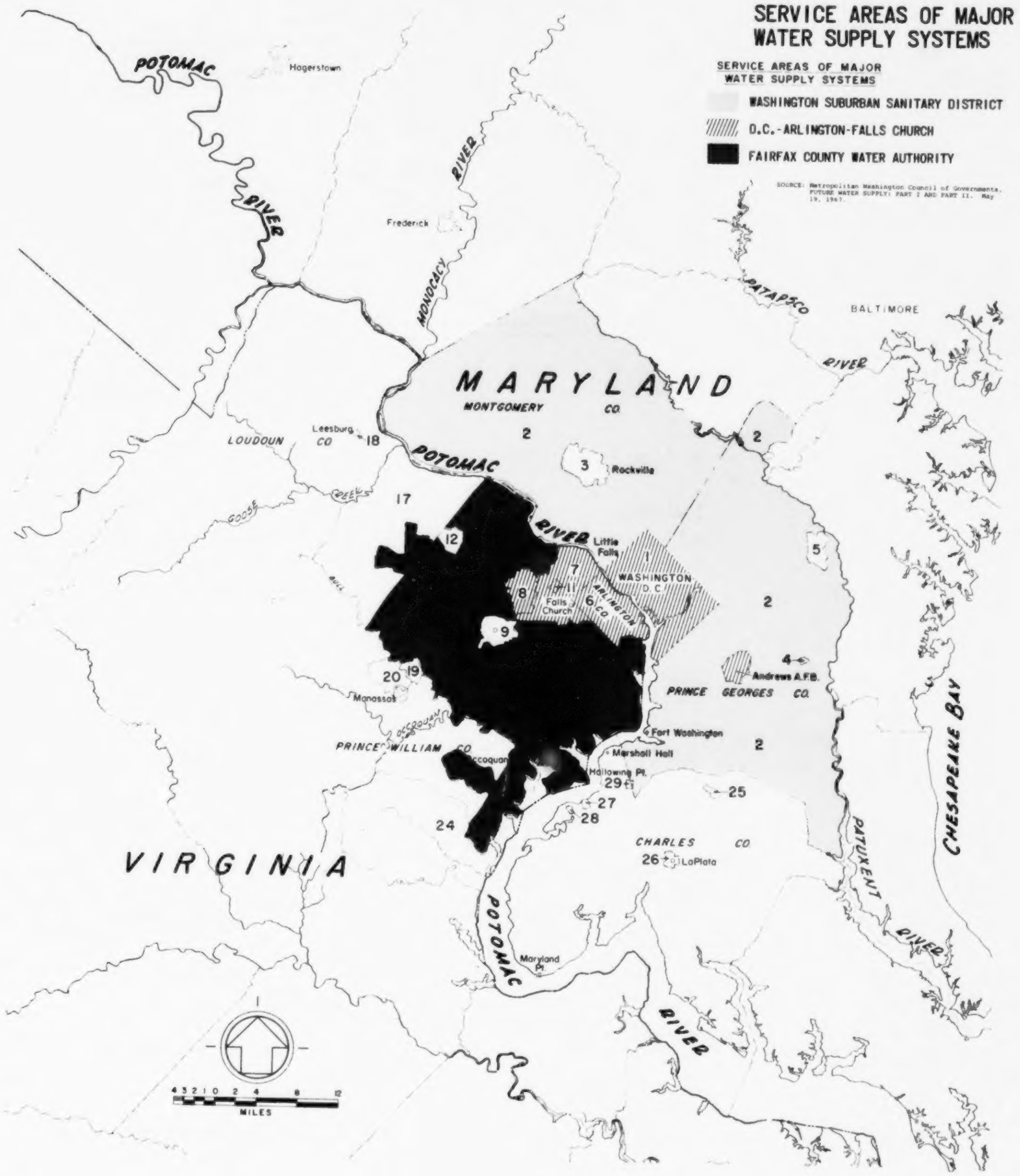
Name of System	Capacity of Raw Water Storage-Billion Gallons	Rated Capacity of Treatment Works - MGD	Capacity of Distribution Storage - MG	Average Daily Demand for 1970 MGD
District of Columbia (Raw water intakes, storage and treatment plants operated by the Washington Aqueduct)	0.20	264	111	159*
Washington Suburban Sanitary Commission	12.64	305	154	120
Fairfax County Water Authority	10.00	46	19.9	25**
City of Fairfax	0.20	6	4.9	6***
Alexandria Water Company	—	—	16.7	13
City of Rockville	—	—	13.4	3.5
Arlington County	—	—	22	22
City of Falls Church	—	—	11.2	12
Other (Estimated)	—	—	16.7	20.5
Total	23.04	629	369.8	381

* The Washington Aqueduct furnishes treated water to Arlington County, Falls Church and six other areas in addition to the District of Columbia (total average demand = 193 MGD)

** The Fairfax County Water Authority also furnishes substantial quantities of water to other Virginia jurisdictions (total average demand = 45 MGD)

*** Includes about 4 MGD for City of Fairfax and 2 MGD for other jurisdictions

FIGURE 4



SERVICE AREAS OF MAJOR WATER SUPPLY SYSTEMS

SERVICE AREAS OF MAJOR WATER SUPPLY SYSTEMS
WASHINGTON SUBURBAN SANITARY DISTRICT
D.C.-ARLINGTON-FALLS CHURCH
FAIRFAX COUNTY WATER AUTHORITY
POTOMAC RIVER
Hagerstown
MONOCACY RIVER
Frederick
PATAPSCO RIVER
BALTIMORE
MARYLAND
MONTGOMERY CO.
2
3
Rockville
Leesburg
LOUDOUN CO
18
17
GOOSE CREEK
BULL
12
Little Falls
1
WASHINGTON D.C.
7
11
8
Falls Church
6
ARLINGTON CO.
9
5
2
4
Andrews A.F.B.
PRINCE GEORGES CO.
20
19
Manassas
OCCOQUAN
PRINCE WILLIAM CO.
Occoquan
Fort Washington
Marshall Hall
Hallowing Pt.
29
27
28
25
24
2
CHARLES CO.
26
LaPlata
VIRGINIA
PATUXENT RIVER
CHESAPEAKE BAY
Maryland Pt.
MILES
4 3 2 1 0 2 4 8 12

SOURCE: Metropolitan Washington Council of Governments, FUTURE WATER SUPPLY: PART I AND PART II. May 19, 1967.

TABLE 3
WATER SYSTEMS

Figure 4 Identification		Source of Water Supply
	D.C. System	
1	Washington	Potomac River
6	Arlington County, Va.	Potomac River
7	Falls Church, Va.	Potomac River
8	Vienna, Va.	Potomac River
	W.S.S.C. System	
2	W.S.S.C.	Potomac River Patuxent River
	F.C.W.A. System	
11	Fairfax County Water Auth.	Occoquan Creek
10	Alexandria Water Company	Occoquan Creek
13	Fort Belvoir	Occoquan Creek
14	D.C. Reformatory	Occoquan Creek
15	Colchester Public Service Corporation	Occoquan Creek
16	Tauxemont Comm. Assoc.	Wells
21	Prince William Water Company	Occoquan Creek
22	Occoquan-Woodbridge S.D.	Occoquan Creek
23	Dumfries-Triangle S.D.	Occoquan Creek
	Other Systems	
9	Fairfax, Va.	Goose Creek
12	Herndon	Goose Creek
17	Loudoun County San. Auth.	Goose Creek
18	Leesburg, Va.	Wells
19	Yorkshire Sanitary District	Wells
20	Greater Manassas San. Dist. Manassas Park, Manassas	Wells
3	Rockville, Md.	Potomac River
4	Upper Marlboro	Wells
5	Belair-Bowie	Wells
24	Quantico Marine Base	Chopawamsic Creek Beaverdam Run
25	Charles Co. San. Comm., Waldorf, Md.	Wells
26	LaPlata	Wells
27	Potomac Heights, Woodland Vil.	Wells
28	Indian Head	Wells
29	Pomonk Utilities, Inc.	Wells

quality data reveals no significant water quality problems in the Potomac (above the estuary) or in other sources currently in use with the exception of temporary waste and odor problems.

Flow in the Potomac River averages 7000 mgd as compared with a projected 2010-2020 average demand of 1375 mgd or a projected maximum daily demand of 2070 mgd from the Potomac. Obviously, enough water flows down the Potomac during the average year to meet all foreseeable needs; however, the Potomac is controlled to a minimum degree and the flow is sporadic, subject to variations in basin rainfall and snow-melt.

The problem for 1980-85 will be one of potential short-term deficits covering periods of several days. Projected average monthly demand for water in 1980-85 will not exceed (although it will nearly equal for one or two months) the minimum average monthly stream flows of record for the respective months. However, during the July-September period when maximum demands will occur in conjunction with low stream flow, there is a potential for an intersection of demand with flow. Figure 5 represents graphically how this could occur. The cross-hatched area between a projected demand pattern and simulated low flow pattern indicates a potential short-term deficit of 3 billion gallons if summer flows approach those simulated in Figure 5.

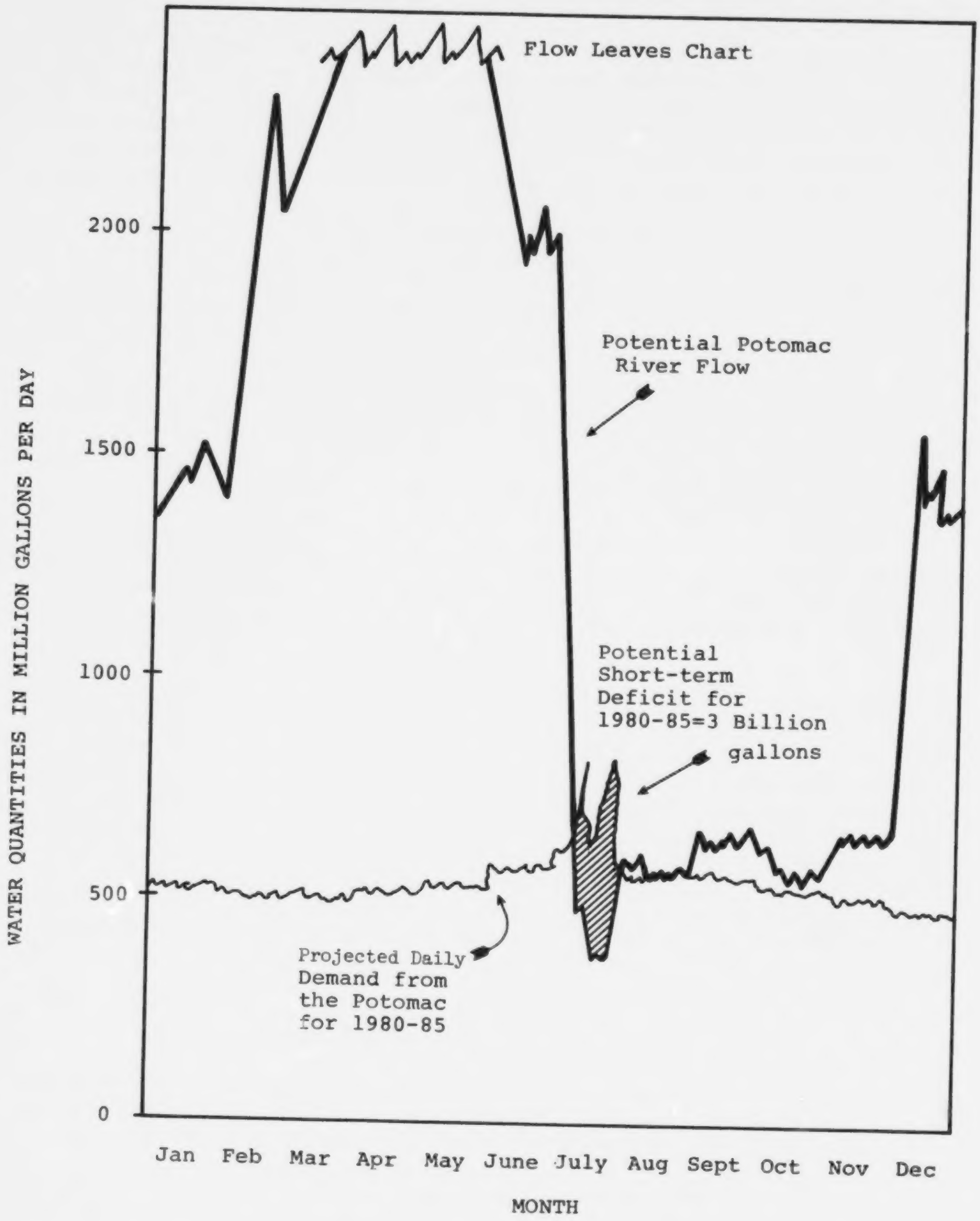
Single day deficits of some magnitude will become a common occurrence by 1980-85. The deficit for a single day on which a maximum daily demand occurs in conjunction with a minimum 7-day streamflow could be as much as 0.5 billion gallons unless remedial steps are taken.

With respect to meeting the long range water supply needs of the Region, no approved comprehensive plan or means for implementation exist that are adequately funded and committed. Unless storage or other regulation is provided, the nature of water shortages for 2010-2020 could change from the occasional short-term deficiencies of 1980-85, to a combination of yearly short-term deficiencies and periodic long-term deficiencies during years of low river flow. Analyzing the minimum monthly average flows of record against a simulated pattern of monthly average demands for 2010-2020 reveals that the deficit period could extend over a period of five months (July-November) and require over 100 billion gallons of additional water to meet needs.

At an increasing and alarming frequency, raw water sources throughout the world are being contaminated by accidental spills of toxic and hazardous substances. In June 1969 a major spill on the Rhine River caused a mass kill of fish. Human damage was only averted by the fact that the chemical involved was relatively nontoxic to man. If a major spill of toxic material were to occur on the Potomac, the Region would be unable to meet its water supply demands, since the means for meeting such an emergency do not exist at present. Individual systems are also subject to accidents which may knock out treatment or

FIGURE 5

POTENTIAL SHORT TERM SUPPLY DEFICIT (1980-85)



distribution capability. At present, the Region's water utilities do not have sufficient interconnections and the flexibility to meet major spill events or emergency accidents which may disrupt normal treatment or distribution capability.

Solid Wastes Disposal

It is estimated that in 1969 some 1,800,000 tons of solid waste were disposed of in the National Capital Region. Of this, approximately one-third was contributed by each of those portions of Maryland and Virginia represented in the Region and the District of Columbia. It is projected that the total solid waste load will increase to 3,300,000 tons, or nearly double the 1969 figure, by 1980.

The above figures exclude the contribution to the total solid waste load of agricultural wastes, abandoned or junked autos, and wastewater treatment solids. While no figures are available on agricultural wastes at this time, the agricultural waste problem has not yet become serious since these wastes are normally disposed of on site. Similarly, the junked auto problem has mainly been one of detitling and collection since scrap yards in the Region shred and reclaim usable metals from automobile bodies.

Recent estimates of the sewage sludge portion of the total solid waste load indicate that in 1970 approximately 40,000 dry tons were incinerated prior to disposal or placed directly on land. With the impending implementation of advanced wastewater treatment practices in the National Capital Region, it is estimated that disposal capacity must be provided in 1980 for some 240,000 dry tons of sludge.

Incineration is being considered for the sludge generated by the Blue Plains sewage treatment plant. For smaller treatment plants other systems such as sludge irrigation or sanitary landfilling of dried sludge must be considered. Regardless of the disposal systems selected, they should be planned and constructed along with modernized treatment plants because existing sludge disposal facilities can adequately accommodate only about one-fifth of the sludge load expected in 1980.

Several trends are bringing about the significant increases in the solid waste load already presented. The increasing acceptance of single-use items and the trend toward increasing use of packaging materials account for much of the projected solid waste load. The slight reduction in the amount of solid waste brought about by the use of household garbage disposals is offset by the increased volumes of sewage sludge produced by the introduction of ground garbage into the sewerage system. The move toward stricter air pollution control standards is causing apartments and office buildings to abandon their incinerators and haul directly to municipal facilities.

Seven municipal incinerators are currently in operation in the National Capital Region. The city of Alexandria has an additional incinerator which may be put back into operation in the future. All these incinerators are operating either at or beyond their design capacity and will eventually require additional air pollution control equipment to meet stricter air quality standards. The District of Columbia is now constructing a new fifth incinerator which was originally intended to replace four older facilities. It may, however, be necessary to utilize two of the existing incinerators even after completion of Incinerator No. 5, depending on the future of other volume reduction and disposal alternatives.

Eight major sanitary landfills are in operation in the National Capital Region for the disposal of incinerator residue and unprocessed solid waste. Prince Georges County has acquired two additional sanitary landfill sites for use in the distant future.

In general, those jurisdictions which comprise the central, heavily populated portion of the National Capital Region face immediate problems in the provision of volume reduction and ultimate disposal capacity. On the other hand, the outlying portions of the Region have sufficient sanitary landfill capacity to carry them through 1980, according to current projections.

Air Pollution

Air pollution in the urban areas of the United States is a regional problem, frequently extending across local and, in many cases, State boundaries. The National Capital Region reflects such a regional problem.

The Region has a common air mass into which the discharge of any pollutants from whatever source cause or contribute to air pollution that is carried indiscriminately throughout the interstate area subject only to the variations of wind and weather. Air pollution originating in one location can thus adversely affect the welfare of and constitute a potential danger to the health of, persons living in a wide area.

The recognition of air pollution as a potential areawide problem can be traced back to the 1950's when one six-day period of heavy smog created a public awareness that the possibility actually existed of experiencing adverse effects from air pollution. This occurred in the late spring of 1959.

Except for electric power generation, heavy industry is not present in this area. Thus, the major sources of particulates and sulfur oxides are caused by fuel combustion, generally coal and residual fuel oil. Disposal of refuse by both on-site and at municipal incinerators also contributes to the over-all problem. Most open-burning has been fairly well eliminated. An emissions inventory conducted in 1967 included estimates for emissions of five major pollutants--particulates, sulfur oxides, carbon monoxide, nitrogen oxides, and total hydrocarbons. This inventory was conducted before controls on open burning and limitations on the sulfur content of fuels suggested in a MWCOG model Air Pollution Control Ordinance were enacted by local governments. Shown below are the amount of emissions for sulfur oxides, carbon monoxide, and particulates for each of the major areas for the year 1967. These three pollutants were chosen because they represent the major pollutant source categories.

1967 ANNUAL AVERAGE OF MEAN DAILY EMISSIONS
(Tons)

Area	Sulfur Dioxide	Carbon Monoxide	Particulates
District of Columbia	175	978	30
Maryland Portion	368	1,300	39
Virginia Portion	147	1,170	26
Total Region	690	3,448	95

The estimate of sulfur oxide pollution levels illustrates the impact of fuel-burning activities (where almost 70% of the sulfur pollution comes from the burning of coal) at private, commercial, or government-owned power plants. Carbon monoxide pollutant levels provide the best indication of the impact of motor vehicles on the regional air pollution pattern, since 98% of all carbon monoxide emitted in the Washington area comes from motor vehicles. Estimates of suspended particulate levels provide the best measure of the combined impact of all pollutant source categories, since, of the five pollutants covered in the emission inventory, particulate emissions are the most evenly distributed by source category (no single source category accounts for more than 28% of the total).

The pattern of emission densities for each of the three major pollutants are closely related to the pattern of urbanization in the central part of the Region. The maximum emission densities pattern in each case extends well into Montgomery and Prince Georges Counties in Maryland and Fairfax County in Virginia. The emission density patterns for sulfur oxides and particulates are complicated by the existence of three major point sources outside of the highly urbanized area but still within the National Capital Region.

The pattern of emission densities and predicted air quality levels for each of the three major pollutants are shown in Figure 6, 7, and 8 as they were traced in 1967. The air sampling program that existed then did not provide sufficient information to allow the concentration lines to be drawn directly from the data. Instead the concentration lines were drawn using diffusion modeling based on data that those scattered stations provided.

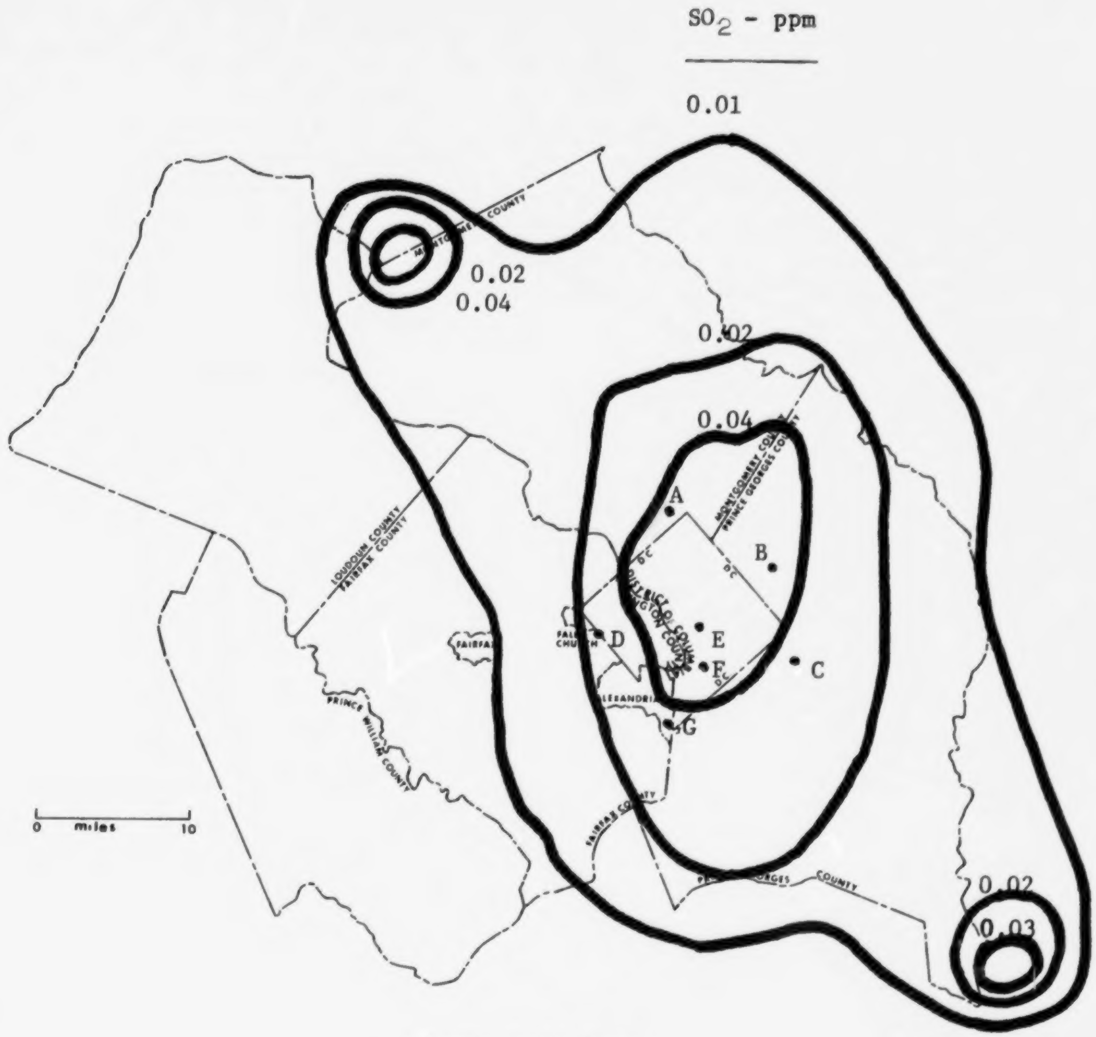
As early as October of 1961, MWCOG established an oxidant sampling network to investigate the seriousness of the problem of automobile exhaust gases. Soon thereafter, the Public Health Service established several additional air monitoring stations in the Washington area to supplement the oxidant network. Data collected from the oxidant network indicated that elevated levels of air pollutants occurred periodically under adverse meteorological conditions. This knowledge caused local officials to quickly recognize that a concerted regional attack on the air pollution problem was necessary. In view of this, six local governments (later eight), through the Council of Governments, set out to pursue an air pollution study which could help in the formulation of measures and programs for the control of air pollution. Financial and technical assistance of USPHS was obtained for this work.

The Clean Air Act Amendments of 1970 required the Administrator, EPA, to promulgate national primary and secondary air quality standards to protect the public health and welfare from the adverse effects of air pollution. National primary ambient air quality standards define levels of air quality which the Administrator of the Environmental Protection Agency judges are necessary, with an adequate margin of safety, to protect the public health. National secondary ambient air quality standards define levels of air quality which the Administrator judges necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Such standards are subject to revision.

During 1970, the annual arithmetic mean of sulfur oxides, measured in the Washington Metropolitan Area, was 63 micrograms per cubic meter. This is below the primary air quality standard proposed by the Environmental Protection Agency of 80 micrograms per cubic meter, and above the secondary standard of 60 micrograms per cubic meter.

Also in 1970, the annual geometric mean of all suspended particulate measurements made within the District of Columbia was 87 micrograms per cubic meter. This is above the primary standard of 75 micrograms per cubic meter and above the secondary standard of 60 micrograms per cubic meter.

In 1970, the second highest hourly average concentration of carbon monoxide, in the Washington Metropolitan Area, was 30 milligrams per cubic meter. This is above the proposed primary and secondary standard of 15 milligrams per cubic meter for a one hour maximum concentration not to be exceeded more than once a year.


SO_2 - ppm
0.01
0.02
0.04
0.02
0.04
0.02
0.03
MONTGOMERY COUNTY
LOUDOUN COUNTY
FAIRFAX COUNTY
PRINCE WILLIAM COUNTY
DISTRICT OF COLUMBIA
ARLINGTON COUNTY
MONTGOMERY COUNTY
PRINCE GEORGES COUNTY
FAIRFAX
FALLS CHURCH
ALEXANDRIA
FAIRFAX COUNTY
PRINCE GEORGES COUNTY
DC
A
B
C
D
E
F
G
0
miles
10

Aerometric Data

STATION	CONCENTRATION, ppm
A	0.05
B	0.05
C	0.04
D	0.03
E	0.05
F	0.06
G	0.05

Figure 6 . Estimated average winter day concentrations of SO_2 in ppm. Includes an assumed 6-hour half-life.

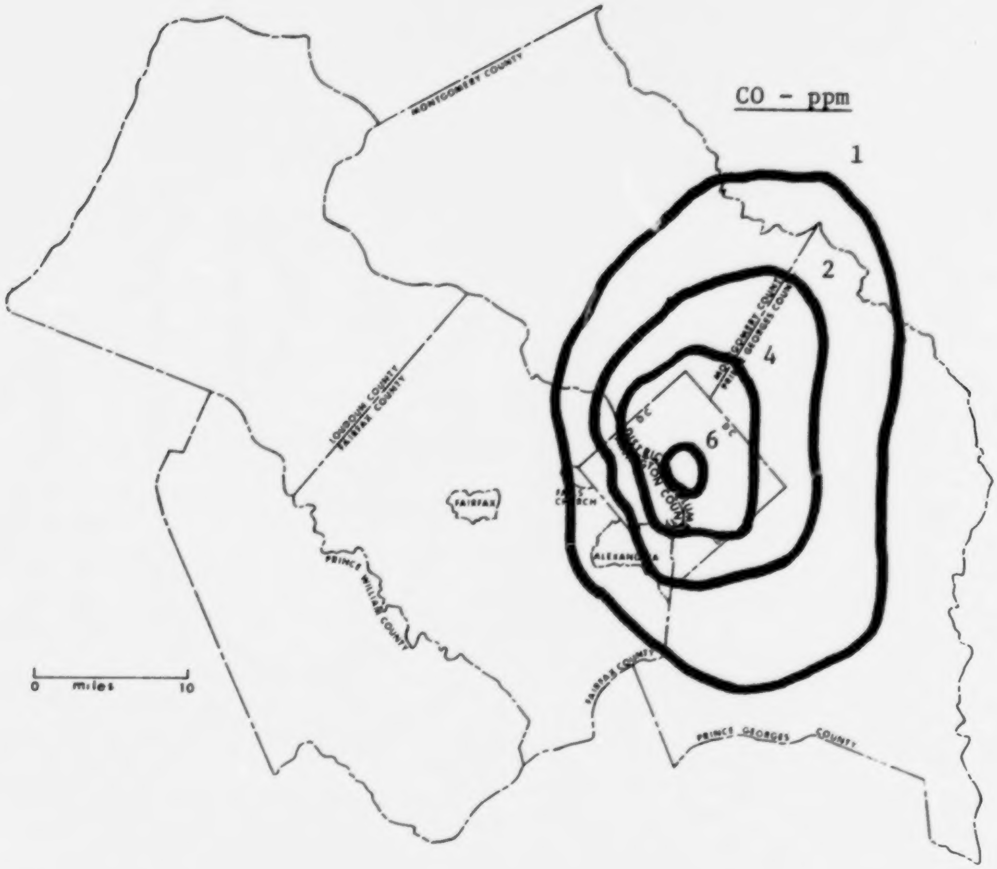

CO - ppm
1
2
4
6
MONTGOMERY COUNTY
LOUDOUN COUNTY
FAIRFAX COUNTY
FAIRFAX
FALLS CHURCH
ALEXANDRIA
ARLINGTON COUNTY
DISTRICT
D.C.
MONTGOMERY COUNTY
PRINCE GEORGES COUNTY
PRINCE WILLIAM COUNTY
FAIRFAX COUNTY
PRINCE GEORGES COUNTY
0 miles 10

Figure 7. Equivalent carbon monoxide concentrations based on average annual emission levels.

Suspended Particulates- g/M^3

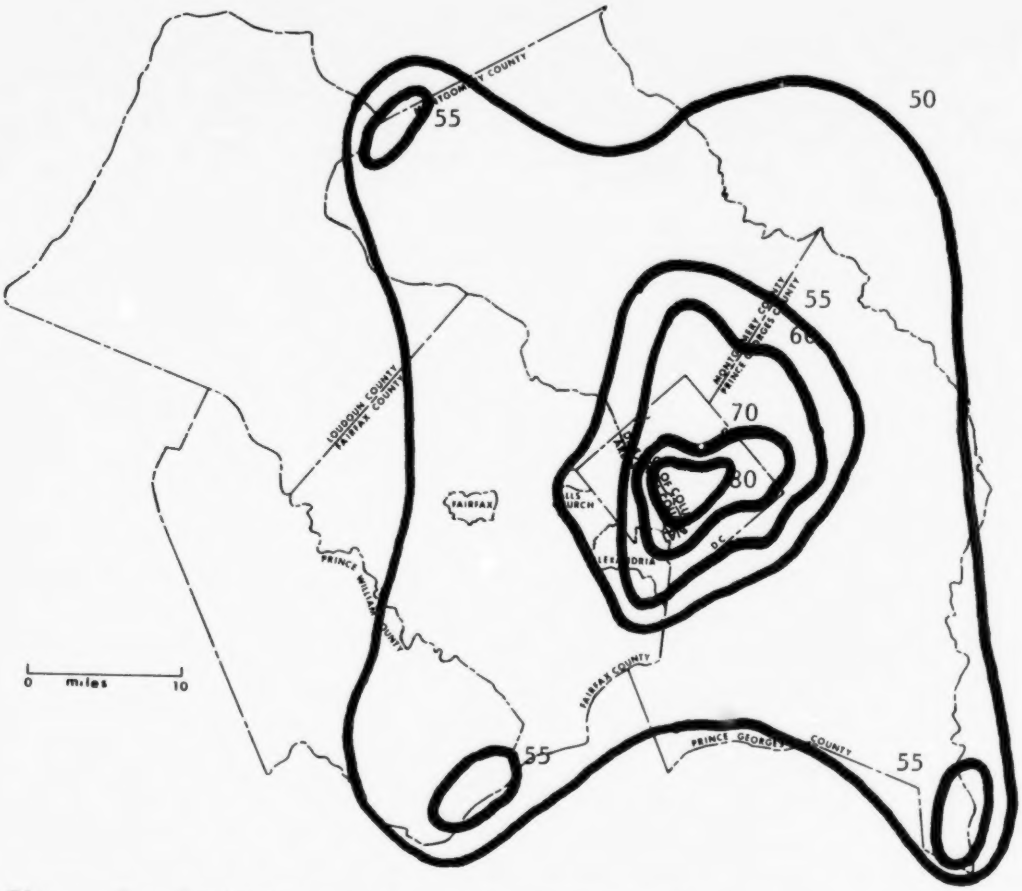

50
55
55
60
70
80
55
55
COUNTY
LOUDOUN COUNTY
FAIRFAX COUNTY
MONTGOMERY COUNTY
PRINCE GEORGES COUNTY
FAIRFAX
PRINCE WILLIAM COUNTY
ALEXANDRIA
D.C.
FAIRFAX COUNTY
PRINCE GEORGES COUNTY
0 miles 10

Figure 8. Estimated annual average concentrations of suspended particulates, above background, no deposition.

Planned and Proposed Efforts to Improve the Environmental Quality

Water Pollution

The worsening situation today vividly demonstrates the need for a long-range comprehensive wastewater management program.

In December of 1970, a "Memorandum of Understanding on the Washington Metropolitan Regional Water Pollution Control Plan" was adopted by the conferees of the Potomac River Enforcement Conference which was first called in 1957 and reconvened in 1969. While the memorandum addressed itself to the most urgent problems, it was not intended to be a comprehensive plan for the entire Washington Metropolitan Area. This "Memorandum of Understanding" was, however, the first formally adopted planning approach to wastewater management for the entire Washington Metropolitan Area. In addition to agreement that the maximum capacity of the Blue Plains Water Pollution Control Plant be limited to 309 mgd, other major items in the memorandum are: (1) delineation of the flow and cost allocations for the Blue Plains facility, (2) provision of additional regional wastewater treatment facilities, (3) development of policy procedures for utilization of additional regional facilities, (4) establishment of construction timetables, and (5) requirement that all agencies make annual evaluations and future projections of sewage flows.

By 1980, the sewage flow in the Region will increase by 140 mgd or about 40 percent. Not only do the present facilities require expanded capacity to handle the increase in flow, but also must be upgraded to provide a higher degree of removal of BOD and unit processes for the removal of nitrogen and phosphorus. For example, waste discharged to the (upper) critical zone will require a BOD removal of 95% to meet water quality standards compared to the current average of 70% removal. Similarly, nitrogen removal must be increased from 15% to over 90% and phosphorus removal increased to over 95% compared to the present 15% removal. These high levels of treatment have been disclosed in reports of studies made in support of the current Potomac Enforcement Conference and the adopted water quality standards.

The long range water quality and wastewater management considerations involve not only wastewater collection and treatment but also additional water supply sources. Projections indicate that the Upper Potomac Interceptor will become overloaded between 1980 and 2000. To provide for wastewater disposal in the area currently served by this interceptor, it will be necessary to either (1) increase interceptor capacity and treat the waste below Washington, or (2) treat the wastewater in the Upper Potomac Estuary region. For the first alternative, studies have indicated that if the wastewater effluents are discharged below the salt water wedge of the estuary, high salinity water will be displaced to the upper estuary and thus reduce its water supply potential. For the second alternative, treated effluent may possibly be discharged above existing water supply intakes. Thus, there is a close interrelationship between long range planning for both water supply and wastewater treatment in the Washington Metropolitan Area.

Sediment and debris control is another long range consideration. Programs to reduce these two forms of pollution will not only be difficult but also expensive. A need exists for the enforcement of silt control programs not only in the National Capital Region but also in the Upper Potomac River Basin. To eliminate the problem of debris, an expanded trash collection and street cleaning program would have a significant effect. The U.S. Army Corps of Engineers should intensify the use of its authority, e.g., the Refuse Act, 33 U.S.C. 407, to minimize the debris problem in the Potomac Estuary. Local ordinances should also be adopted to control debris causing sources.

Pollution abatement programs should also take into account the relative contributions of storm and combined sewers and, where appropriate, be designed to reduce their effects on the water quality of the Upper Potomac Estuary and the tidal portion of the Anacostia River. Control of combined sewer overflows has been historically unsuccessful, primarily because of technical problems in developing solutions, measuring pollution reduction benefits, and the high costs associated with controlling such problems.

Recent studies, such as the Kingman Lake project feasibility study undertaken by the Water Quality Office, EPA, indicate that control and treatment of combined sewer overflows is feasible. The Kingman Lake project would incorporate utilization of reclaimed wastewater in a water oriented recreational facility. It is estimated to cost about $50,000,000. Based primarily on expected recreational benefits, the benefit-cost ratio of the project has been estimated to be 1.6 and would provide a least-cost alternative over a single purpose project designed specifically for reduction of overflows.

Based upon a comprehensive integrated approach which would utilize techniques such as the Kingman Lake Project, deep tunnel and cavern storage, and other innovative control and treatment techniques, it has been estimated that the cost of reducing the impact of combined sewer overflows for the District of Columbia would be about $200,000,000.

A study of the combined sewer overflow problem and development of an abatement plan for the city of Alexandria, Virginia, is currently about 80 percent complete.

Water Supply

The problem of water shortage has arisen at a place and time when few technological or physical obstacles exist for its solution. The demand for water from the Potomac is already approaching perilously close to the available flow in the river; forecasts for 1980-85 indicate a potential short-term deficit of about 3.0 billion gallons, and for 2010-2020 the potential deficit is over 100 billion gallons. Loss of water during critical periods could have profound effects on the life of the people; their health could be endangered by loss of system pressure with resulting back-siphonage and contamination; difficulties could be encountered in providing water to fight fires; and amenities would be reduced. Additionally, the many separate public water systems of the area do not have alternate source plans or available storage to meet emergency or spill events which might temporarily inactivate a part of their system.

Several Federal agencies have conducted numerous studies and have submitted reports to the executive and legislative branches of government on the location and costs of reservoir sites to control the flows of the Potomac for beneficial water use. The U.S. Corps of Engineers, the Public Health Service and the Federal Water Pollution Control Administration have all been involved in these studies. In addition, the Interstate Commission on the Potomac River Basin, the States of Maryland and Virginia, and local water supply authorities have conducted their own independent studies. More recently the Regional Sanitary Advisory Board of the Metropolitan Washington Council of Governments (MWCOG) has become interested in the problems and has conducted their own independent studies. The MWCOG also has taken the initiative in attempting to coordinate the activities of the various interested public and private agencies. Several of the agencies mentioned above have contracted with private consultant firms to conduct additional special studies of the Region's water supply problem. There are a total of about 20 separate governmental and private agencies located in Maryland, Virginia, and the District of Columbia, distributing water in the Region. Coordinating all these interests into a uniform common program of action for the common good is extremely difficult, but necessary.

From an analysis of the studies completed to date, the published reports all conclude that upstream water impoundments are needed to increase the low flows in the Potomac River in the National Capital Region. Where these reservoir sites are to be located and how the water stored in them is to be managed, however, has not been clearly indicated. Studies by the Corps of Engineers originally identified 17 most feasible locations. However, in submitting their 1969 report to Congress only three sites were recommended for authorization. One of these, Bloomington, has been authorized and could be completed by 1977 if construction starts soon. The two other impoundments recommended for authorization are Sixes Bridge and Verona. Assuming authorization by the present Congress, they would not be on the line before 1978 or 1979. According to the Corps' report, releases from Bloomington could increase the low flows at the Potomac River Falls by 137 mgd. The dam would be about 170 miles upstream and the flow time would be approximately 28 days from the dam to the Potomac intakes.

None of the proposed plans, however, could be implemented and the necessary facilities constructed soon enough to meet the immediate needs of the National Capital Region as it pertains to impending short-term deficits during drought periods or emergency and spill situations.

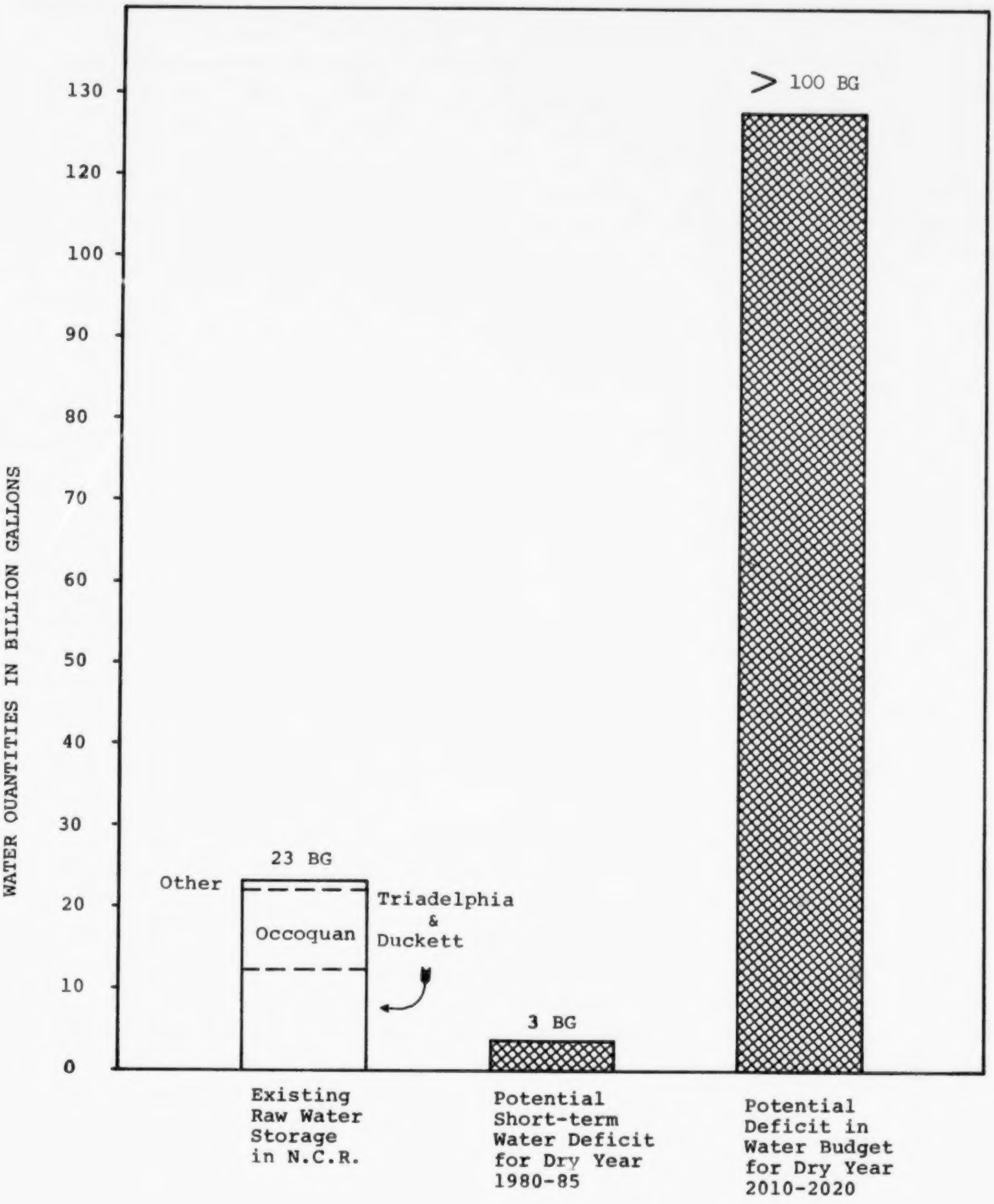
The most immediate and obvious source of fresh water during emergency periods is the Potomac Estuary. While the estuary contains a large volume of fresh water, the amount which can be withdrawn, giving full recognition to the public health aspects, is unknown. At present, the Corps of Engineers is planning to construct an emergency system for pumping 100 mgd from just below Chain Bridge into the Dalecarlia Reservoir; this system will not be operational until the summer of 1972.

While the short-term use of the estuary has undoubted utility, its long-term utility is less certain until all public health implications are more fully understood and adequate control measures assured. The water pumped from the estuary for water supply purposes will be a mixture of fresh water inflow and portions of the storm water runoff and treated wastewater effluents discharged to the estuary from the National Capital Region. Introduction of estuary waters into the water supply system may present special problems which demand that the best available technology for treatment, disinfection and quality control be utilized. Limited studies with regards to viruses in water indicate that viruses, in general, are much harder to destroy by disinfection than are bacteria. In view of a threat of an immediate water shortage, however, it is contemplated that emergency pumpage from the estuary is the only feasible solution immediately available.

Figure 9 shows graphically the potential water deficits for 1980-85 and 2010-2020 as plotted against locally available storage. From an examination of this figure, it would appear that sufficient storage (over 20 billion gallons) exists to account for the potential 3.0 BG short-term deficit for 1980-85; however, this conclusion is not correct since the major intakes and treatment works are on the Potomac and the storage is located elsewhere without the requisite connections and facilities to make it available to the treatment works.

FIGURE 9

EXISTING STORAGE AND POTENTIAL STORAGE DEFICITS
(1980-85 and 2010-20)



One scheme to make part of the storage available which is worthy of detailed study would be to pump from the Potomac to the Tridelphia-T. Howard Duckett Reservoirs; locate a new major water treatment plant at the WSSC Patuxent Plant, and; increase the Patuxent to Wheaton treated water transmission pipeline capacity. The expanded Patuxent Plant would operate full scale all year, utilizing Potomac water at time of adequate flow. But at low-flow shortage periods, pumping from the Potomac to Triadelphia would be halted and the Patuxent Plant would operate on the 12.5 billion gallon storage in Triadelphia-T. Howard Duckett Reservoirs, thereby leaving the Potomac flow for full use by the other involved utilities. More detailed examination should be made of approaches for the improved utilization of the Triadelphia-T. Howard Duckett and the Occoquan Reservoirs as storage to meet peak demands during low-flow periods.

While pumping of the estuary and schemes to improve utilization of available raw water storage may be helpful, steps to increase directly the quantity of available nearby storage are still needed. One such step as proposed by the 1968 report by a Board of Engineers for MWCOG would be a single-purpose water supply reservoir on Goose Creek in Loudoun County, Virginia. The Virginia Division of Water Resources has also proposed a 55 BG reservoir on Goose Creek at a cost of $13 million. Such a reservoir alone, if under the ownership and control of a regional entity, could provide the capacity, and flexibility to meet the Region's needs up to and through 1980-85.

The Potomac intakes of local utilities are strongly subject to temporal flows and problems in the river. To remedy this and to provide flexibility for the future, ground level or pumped reservoir storage could be provided off-stream in the vicinity of the intakes above Great Falls. Existing and proposed intakes could be integrated with this storage so that it would be available as the regular or alternate source of raw water. This storage scheme should give a buffer of four or more days of average demand to allow the passage of toxic or hazardous materials which could be accidentally spilled into the Potomac mainstream. It would also have obvious advantages in making substantial quantities of water always available at the point of need.

To meet the deficit needs of over 100 billion gallons possible in the years 2010-2020, the steps cited for 1980-85 will be helpful but much more must be done since the deficit could be so large and since it may extend over a period of five months (July-November).

To provide the available quantities as needed, earmarked municipal water storage must be twice the deficit need or over 200 billion gallons. Over half of this storage could be provided in single purpose reservoirs under the specific control of the regional entity with the remaining provided by multipurpose or other projects. The excess capacity will be needed since inefficiency in water use may accompany releases from remote reservoirs; limitations will exist in the use of multipurpose reservoirs for water supply needs; and, a safety factor is needed in case of repeated drought years or emergencies. If a 55 billion gallon capacity Goose Creek Reservoir is constructed by 1980-85, the needed additional storage of over 150 billion gallons should be planned and provided. Early attention should be given to a further single purpose site near the National Capital Region and to the purchase of water supply storage in multipurpose projects at remote sites. Planning and site preservation should proceed as to both type reservoirs at an early date.

Specific planning and implementation steps (interconnections, cooperative schemes, etc.) should be set in motion to secure the kind of network of public water systems which will render the most effective and economical service to the Region for the years 2010-2020 and after.

The urgency and magnitude of water supply problems and the need for their positive resolution dictate that increased reliance be placed on single-purpose water supply reservoirs responsive to the National Capital Region's spontaneous needs as a companion to multipurpose basinwide reservoir projects.

Multipurpose basinwide reservoirs have several difficulties with regard to meeting the needs of the Region. They are remote with a travel time to the Region which would limit flexibility to meet short-term needs; their utility to provide water on demand would be limited by a need to serve other purposes and to meet the needs of the local cooperators. For instance, in the Corps of Engineers proposal for Bloomington and the so-called "six pack"--Verona, Sixes Bridge, Town Creek, North Mountain, Sideling Hill and Little Cacapon--only the latter four include storage earmarked to help meet the National Capital Region's needs and they have not been recommended for authorization. Bloomington, Verona, and Sixes Bridge are formulated principally to meet upstream, local needs. Data obtained from the Corps of Engineers on projected future flows indicates that about 170 BG of low-flow augmentation storage in these projects would result in only a 367 mgd increase in future dependable flow over a four-month period during a "50 year" drought at the Potomac water intakes as against a needed 1682 mgd increase to meet a maximum demand--low-flow day during 2010-2020. As a consequence, the Bloomington and "six pack" proposal alone appear insufficient to meet the needs.

Single-purpose water supply reservoirs at nearby locations can solve the problem of flexibility to meet immediate deficits; their use can be factored with upstream projects to provide better efficiency in meeting long-term needs. Furthermore, their availability can assure the National Capital Region a water supply which will clearly be responsive to its needs.

Solid Wastes Disposal

Solid waste disposal needs and land use plans have never been integrated to the extent necessary to guarantee adequate solid waste disposal capacities in the Region. Even in those areas where sufficient disposal capacity is currently available, it will be necessary to begin long-range planning for solid waste disposal immediately. In 1970, the District of Columbia released a solid waste management plan for the District, performed under a Federal Solid Wastes Office planning grant. Currently, the Metropolitan Washington Council of Governments is working toward the design and analysis of a regional solid waste disposal system under another Solid Wastes Office planning grant. Much of the data in this report are based on the results of these two studies.

The Council of Governments is working to establish a program to provide supplementary solid waste disposal service to areas of Northern Virginia and possibly Montgomery County, Maryland through the Metropolitan Washington Waste Management Agency. Rail transport of solid wastes to distant sanitary landfills is being contemplated with the intention of eventually being able to separate certain wastes for resale as raw materials. A large regional reclamation effort would provide the economies of scale so necessary to this process.

In the absence of an adopted long-range plan for the Region and a regional authority to implement the plan, the current proposals for meeting the solid wastes disposal needs of the National Capital Region are as follows:

District of Columbia

In the absence of available land within the District for sanitary landfilling, construction and implementation of a volume reduction processing facility to prepare incinerator residue and raw waste for long-haul transportation and disposal by sanitary landfilling is being planned. The District has been successful in negotiating for sanitary landfill space in Prince William County at Cockpit Point. Final approvals are being sought and construction of barge or rail transportation facilities is scheduled to begin shortly. Abandonment of at least two of the existing incinerators will be possible after construction of Incinerator No. 5 and the supplemental processing/transportation system.

Montgomery and Prince Georges County

Construction of an incinerator in Prince Georges County by 1975 and immediate addition of more sophisticated air pollution control equipment to an existing incinerator in Montgomery County will provide significant volume reduction. An additional site for incinerator residue and bulky waste disposal will be necessary in Montgomery County. A transfer station is to be constructed in 1976 as a part of the Prince Georges County refuse collection system to allow use of an outlying sanitary landfill. Implementation of a regional disposal system could provide an alternative disposal system in the industrial portion of Prince Georges County. A regional disposal system might include volume reduction processing/transportation facilities in the area in addition to the previously mentioned facilities.

Northern Virginia

The outlying areas of the Virginia portion of the National Capital Region will continue to utilize their existing sanitary landfill capacity through 1980. The close-in area of this portion of Virginia must, however, upgrade existing incinerators to meet air pollution standards or abandon incineration in favor of regional volume reduction processing and distant sanitary landfill. Existing sanitary landfill capacity for both incinerator residue and unprocessed waste disposal will be depleted in about three years. Fairfax County, Virginia, has announced that it intends to close its landfills and abandon that technique of disposal by 1977.

Resource recovery from solid wastes will require installation of equipment currently under development in processing plants located near adequate transportation facilities. Markets for reclaimed materials must be developed. Few solid waste disposal facilities in the Region are amenable for conversion for resource recovery, therefore new processing plants must be constructed.

Initiation and implementation of a regional solid waste disposal agency at this time could effectively provide a solution to the immediate disposal problems of the District of Columbia and the other jurisdictions in the Region's center, with responsibility for storage and collection aspects of solid waste management systems remaining with the individual jurisdictions. This agency could also undertake the long-range disposal planning for the entire National Capital Region.

Air Pollution

The Clean Air Act, as amended in 1967 and in 1970, provides the legislative blueprint for action in the control of air pollution. Briefly stated, the Act provides for the designation of air quality control regions based upon jurisdictional boundaries, urban-industrial concentrations and other factors necessary to implement national ambient air quality standards. On the basis of this authority, the National Capital Interstate Air Quality Control Region was defined as a problem area and so designated on September 30, 1968, by the Secretary, Department of Health, Education and Welfare.

In accordance with the Act, after a Region has been designated the affected states are expected to hold hearings and to adopt plans for implementation of national ambient air quality standards. These plans are to be submitted to the Administrator, Environmental Protection Agency, within nine months after the promulgation of air quality standards. These plans must provide for the attainment of primary air quality standards within three years after approval by the Administrator and for the attainment of secondary standards within a reasonable time.

Each state is encouraged to submit one plan for the entire state detailing only those special requirements (i.e., resources, regulations, abatement strategy) that may be required for a specific region. At this time, plans have already been submitted for the Region for sulfur oxides and particulates. These plans are pending approval and will be evaluated in light of the 1970 Clean Air Amendments and promulgated national ambient air quality standards.

These existing implementation plans for the Region (sulfur oxides and suspended particulates) must be evaluated by July 29, 1971. Implementation plans for the remaining four pollutants for which there are National Ambient Air Quality Standards must be submitted by January 31, 1972. By definition of an air quality control region, each state becomes somewhat dependent on the other to insure that standards will be met. This is particularly true for the automotive pollutants where mobile sources are involved, and for emergency episode planning. The Clean Air Amendments encourages intergovernmental cooperation, including the requirement that states provide measures to insure that emissions of air pollutants from sources located in an air quality control region not interfere with attainment or maintenance of standards in any portion of such region outside of such state. The states are also required to provide adequate planning for land use and transportation to insure that standards are met and maintained.

Where air quality control regions cross state boundaries, the Act authorizes the formation of interstate air quality planning agencies to recommend to the governors measures to coordinate effective air pollution control.

State requirements in an interstate area could most effectively be met by the establishment of a suitable interstate air quality planning agency. Such an agency must have the following functions and authority: to coordinate development and preparation of a master plan for air pollution control activities in the National Capital Region; to coordinate development of emergency episode plans and procedures; to coordinate implementation of emergency episode procedures; to recommend and coordinate development of appropriate uniform motor vehicle controls and inspection procedures; to develop land use and transportation control policies; to develop a plan for ambient air sampling site location and for sampling frequency; and to recommend and coordinate implementation of enforcement schedules for effecting compliance of multiple-site stationary pollution sources. Section 106 of the Clean Air Act, as amended, provides authorization for the Administrator to pay for support of air quality planning programs for the purpose of developing implementation plans for interstate air quality control regions.

Within the National Capital Region, agreement on the formation of an air quality planning agency is being pursued by the Council of Governments and is expected to be achieved in the near future.

Within the National Capital Metropolitan Area the three state agencies are actively carrying out programs. The District also acts as a local air pollution control agency and is joined by Alexandria, Fairfax County and Arlington County, Virginia, and by Montgomery County and Prince George's County, Maryland. With the exception of Arlington County, all the State and local agencies receive significant Federal program support from the Environmental Protection Agency. The air pollution problems in each county in the metropolitan area are somewhat different, reflecting requirements for prevention and/or abatement, and varying program needs for enforcement. The existing state and local agencies have achieved different levels of competency as a result of program need, air pollution problems, length of operation, and available resources. These levels of program capability and need differ in areas of sampling, analysis, regulations, and resources. Basically, since most of these programs have existed for three years or longer, each program is now significantly involved in enforcement efforts, and total control agency resources are generally adequate.

The Regional Air Pollution Advisory Board (RAPAB) of MWCOG has served these agencies in a planning role in the past. The RAPAB was an outgrowth of the Automobile Nuisance Abatement Committee which was established in 1960 as a result of the 1959 smog episode. Discussions at RAPAB meetings have centered around emergency episode planning, data handling for the region, sampling techniques and other key areas. The RAPAB has been only moderately successful in attaining uniformity and close coordination in these areas. At present, coordination between agencies, even agencies within the same state, is inadequate.

An emergency episode plan for the Washington Metropolitan Area is coordinated by the Metropolitan Washington Council of Governments. It includes four levels, which, progressing from least serious to most serious are: watch, advisory, alert, and emergency. The watch stage, based on a high air pollution potential advisory from the National Oceanographic and Atmospheric Administration and rising air pollutant levels, has been reached about ten times in the past two years. No action is required at this level although local sampling stations are notified and sampling frequency is increased. The advisory stage, which is based on higher air pollutant levels, was reached once: during the last week of July 1970. Control measures were taken on a voluntary basis and the public was notified of the advisory. The alert and emergency levels have never been reached.

The costs associated with air pollution control programs consist primarily of staff salaries and the purchase of services (facilities, utilities, etc.) required in direct support of program staff. Equipment costs represent only about 10% of the total cost of control programs.

Financial support of the control program operations is also provided by the state and local jurisdictions which carry out the air pollution control activities in the Region. Table 4 is a tabulation of the present and estimated future expenditures of the agencies in the Region. The projected costs for 1974 are estimates of the necessary annual operating needs associated with comprehensive and effective control programs throughout the Region. From this assessment it is noted that, while present funding levels are generally adequate to meet the needs, reorientation between geographical and functional areas will be required in some cases.

Current Barriers to Improving the Environment

Water Pollution

Historically, sewage treatment facilities in the National Capital Region have been overloaded. This is due in part to the underestimation of population growth and the combined sewer systems of the District of Columbia and the city of Alexandria. The entire history of wastewater management has been reactive in character; that is, the need for services was always greater than the capacity of the facilities to provide services. This condition holds true today.

The burgeoning population growth in the National Capital Region has compounded the water pollution control problem in two primary ways. The accelerated population growth has completely outstripped attempts to provide adequate facilities for wastewater treatment. In addition, much of the growth has been uncontrolled in nature and location and it is now difficult to provide adequate collection and treatment within the space limitations now imposed on such facilities in the area.

The worsening situation today is the result of the lack of an adopted long-range comprehensive wastewater management program. No binding comprehensive program exists today although numerous studies have been made. Historically, planning has usually been done on an individual project basis. While cooperative programs have been carried out, such as the Dulles Interceptor program, these were usually limited to providing services for a given area and not for managing the water quality of the estuary.

The current plans to control water pollution in the National Capital Region developed by the 1969 Enforcement Conference established a step-by-step timetable leading to the completion of needed treatment facility construction. For the major waste discharger in the area, the District of Columbia treatment facility at Blue Plains, progress was slow

TABLE 4
ESTIMATED ANNUAL OPERATING COSTS[1]
COMPREHENSIVE AIR QUALITY CONTROL PROGRAM
FOR THE
NATIONAL CAPITAL INTERSTATE AIR QUALITY CONTROL REGION

		FY 1970	FY 1974
Management Operations			
Salaries		342,000	363,860
Operating Expense Facilities and Support		82,100	121,701
Capital Expense		26,500	9,500
SUBTOTAL		450,600	495,061
Enforcement Operations			
Salaries		284,200	279,110
Operating Expense Facilities and Support		68,400	93,112
Capital Expense		22,100	8,500
SUBTOTAL		374,700	380,722
Engineering Operations			
Salaries		142,300	150,855
Operating Expense Facilities and Support		34,200	50,285
Capital Expense		11,050	8,000
SUBTOTAL		187,550	209,140
Technical Service Operations			
Salaries		180,500	205,095
Operating Expense Facilities and Support		43,250	68,365
Capital Expense		14,000	3,000
SUBTOTAL		237,750	276,460
TOTAL COSTS FOR REGION		1,250,600	1,361,383
	Local	438,571	
	Federal	812,029	

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[1] Based on 1970 Census data

in developing plans to meet the established time schedule. Problems centered primarily around the inability of the jurisdictions and agencies involved to agree on a suitable plan for meeting the schedule. A major element of disagreement was the limitation on treatment capacity at the Blue Plains facility, which was considerably lower than that required to treat projected waste flows from the District of Columbia and the Maryland suburbs in the very near future.

In the fall of 1970, the parties involved with the Blue Plains problem developed a "Memorandum of Understanding on Washington Metropolitan Regional Water Pollution Control Plan." This memorandum of understanding was the first formally adopted planning approach to wastewater management in the Washington Metropolitan Area. It recognized that the maximum capacity of the Blue Plains Water Pollution Control Plant should be limited to 309 mgd and established the basis for financing and sharing in the proposed expansion and upgrading of this facility. It also recognized the need for the development of a second regional wastewater treatment facility and established a timetable for the development of plans for this facility and a means for interjurisdictional sharing in the treatment capacity of that plant. While the memorandum addressed itself to the most urgent problem associated with the Blue Plains facility, it is severely limited as a planning document. It is not a comprehensive or legally binding plan for the entire National Capital Region.

The Enforcement Conference has put some semblance of order into the programs to abate pollution of the Potomac River in the National Capital Region. However, the mere existence of the Enforcement Conference is indicative of the lack of planning and coordinated implementation of effective abatement and control programs by the various jurisdictions in the area. The continued fragmentation of jurisdictional bodies each striving to provide waste treatment service to meet their own confined areas of interest will not provide for effective abatement of present problems or for meeting increasingly more complex problems in the near future.

The primary problem which must be overcome in providing the wastewater treatment requirements as stipulated by the Potomac Enforcement Conference is financial. The total capital cost of these improvements, if storm and combined sewer control estimated costs are included, is estimated to be approximately $857,000,000 for the program through 1980. This includes the estimated capital cost of $492,000,000 for waste treatment measures, and related interceptor costs, which would be required to meet the 1974 deadline as set by the Potomac Enforcement Conference. The remaining $365,000,000 costs are those associated with new plants and improvements, and storm and combined sewer control.

Of the $856,400,000 total, $568,600,000 or 66 percent is needed to expand and upgrade the Blue Plains facility and to reduce the combined sewer overflows in the District of Columbia where the major difficulties arise.

A facilities cost delineation for the regional wastewater management programs discussed is given below:

Program*	Estimated Cost
Wastewater Interception	$ 81,600,000
Wastewater Treatment	574,800,000
Combined Sewer Control and Treatment	200,000,000
TOTAL	$856,400,000

* Under current programs and legislation proposed by the Administration, waste treatment systems and interceptor sewers would be eligible for up to 55% Federal funding. Combined sewer projects have not been approved for Federal grant assistance.

The annual cost of operation and maintenance for these facilities is estimated to be approximately $46,300,000.

Estimates of the long-range needs indicate that approximately $400,000,000 additional capital cost will be required to meet the increased flows for the period of 1980-2000 and with approximately $900,000,000 more required for 2000-2020. The cost of operation and maintenance is expected to increase to $72,000,000 per year. This illustrates the need for adequate funding to meet these existing and future requirements.

Water Supply

Most technological and physical answers to water supply shortages exist; the problem is that there has never been a single agency representing the National Capital Region with enough planning, implementation, and financing powers to achieve needed solutions.

In a realistic sense, water utilities in the National Capital Region present a picture of self-sufficient domains with little interplay or articulation between systems. Without a common basis for action among themselves, they have failed to solve a critical raw water shortage problem. Furthermore, the current expansion plans of individual systems will simply heighten the problem by increasing dependence on the Potomac for raw water without providing the necessary storage and control of flows.

As the fringes of the independent distribution systems are approached, the pipe sizes fall so that existing interconnections are mainly small capacity pipes. If the systems had been integrated from their origin, straightforward engineering and economic efficiency would have dictated a different orientation in the supply of water with larger interconnections and a more efficient, articulated system.

Solutions to problems of raw water shortage and of providing adequate quantities of safe water to all people in the Region will depend upon recognition of the problems as being regional in nature and therefore requiring effective unified regional action.

Solid Waste Disposal

Solid waste disposal is a recurring governmental problem among local jurisdictions in the National Capital Region. Recently, quantities of solid wastes have increased rapidly, severely taxing the ability of local disposal facilities to handle them. Local governments are not, however, entirely free to expand disposal capacity to meet the increased need. Citizen apprehension of possible pollution from waste disposal operations and of their alleged adverse effects on surrounding land values has caused great resistance to any expansion or relocation of facilities. Resource recovery is one of the most frequently suggested alternatives to the need for more disposal capacity across the Region.

In nearly every case each jurisdiction in the Region has neglected adequated planning for solid waste disposal. Solid waste disposal needs and land-use plans have never been integrated to the extent necessary to guarantee adequate solid waste disposal capacities in the Region.

Virtually no comprehensive land-use plan has recognized the opportunity to acquire and retain open space permanently through the use of land for sanitary landfilling. This neglect is more than missed opportunity; it forces solid waste planners to consider only hastily devised, usually short-term plans.

One reason for this lack of planning is the public apathy with regard to the need for solid waste management. The public has not developed an appreciation of the scope of the solid waste problem and has, therefore, been unwilling to provide the necessary finances and even more unwilling to accept the location of proposed volume reduction or disposal facilities. Competing land uses have only tended to increase this unwillingness.

Financing the solid waste facilities required in the future solid waste management programs presents a serious obstacle to effective implementation of any viable proposals. The projected capital investment for processing and disposal facilities planned by present owners through 1980 for the entire Region amounts to $54.5 million and projected 1980 annual operating and maintenance costs amount to $13.4 million. The projected capital investments for the facilities amenable to regional operation (to be discussed in Chapter VI) amounts to $56.7 million through 1980 with annual operating and maintenance costs of $10.7 million in 1980. The increased capital cost of the proposed regional system is the result of the addition of facilities not presently planned. These additional facilities will not only result in the improvement of the environmental quality, but will produce reduced operation and maintenance costs through economics of scale.

Air Pollution

Present obstacles to solving the air pollution problems of the Region include lack of uniformity in air pollution sampling techniques and lack of suitable methods for data reduction. Sampling networks which are adequate for single jurisdictions are not always adequate to monitor air pollution across the Region. There are limited detailed plans to restrict major sources of pollution during periods of atmospheric stagnation. In addition, policies in different programs to enforce their program objectives have not been uniform. These kinds of problems must be resolved in order to develop acceptable State implementation plans for the prevention and control of air pollution in air quality control regions. The Air Pollution Control Office, EPA, has placed top priority on providing the various kinds of technical assistance needed by State agencies to prepare their plans and to overcome these obstacles.

Some areas within the National Capital Air Quality Control Region have undesirable levels for certain air pollutants. Outlying rural areas share some of these pollution problems because of meteorological factors, but existing air pollution levels in these outlying areas do not exceed standards which would create effects on health or welfare. In these areas it is necessary under the Clean Air Act, and desirable for the communities, to maintain the air quality and prevent increasing air pollution. In the concentrated urban core, existing air pollution must be lessened by adhering to prescribed time schedules for abatement.

To effectively implement both control and prevention programs in a region requires coordination and planning of all agencies on a regional basis. Implementation plans submitted by the states to achieve standards must consider land use techniques and transportation planning as it affects air quality levels. Highway construction can increase congestion in urban areas, as well as alleviate such congestion. Additional highways tend to increase motor vehicles, a major air pollution source.

Automobiles presently crossing state lines into the District and other areas may not be adequately controlled for exhaust emissions. At present there is not a suitable regional mechanism to correct the problem. Rural areas in outlying counties within the Region become more attractive to industry, which, if not suitably located and controlled, could substantially degrade acceptable air quality. This does not mean that industry is not desired, but through effective regional planning its air pollution impact could be minimized. Studies in regional planning for industrial sites and highway construction should consider existing air quality levels, meteorological conditions, growth potential, topographical characteristics, and short and long-term impact.

To satisfactorily solve these problems, coordination is not only necessary between the air pollution control agencies, but also with the highway commissions, state boards, planning commissions, health departments and other governmental units. An air quality planning agency could oversee this planning.

Special Problems in Financing

Deficiencies in the present financial arrangements have significantly contributed to the current environmental problems. Some of these deficiencies are traceable to attitudes regionwide which have placed a relatively low priority on waste management programs. Others derive from the lack of adequate financial mechanisms for raising the necessary funds.

The District of Columbia does not have bonding power or any power of appropriation. Its budget is submitted as part of the Budget of the United States and is subject to Congressional review and change. Funds for sanitary engineering projects are included as part of the total District budget and can be significantly influenced by actions and pressures on other parts of the budget. Revenues from water and sewerage services are placed into special accounts with the Treasury and are unavailable to the District until reappropriated by Congress.

Some capital improvement outlays are financed directly out of revenues upon appropriation by Congress. Major capital outlay programs are financed from loans received from the U. S. Treasury. Congress establishes the loan authority for each of the special accounts and makes appropriations to these accounts from which the District secures loans from the U. S. Treasury. Interest and principal are paid to the Treasury through the operating budgets. These constraints have limited the District's ability to implement an adequate waste management construction program and to carry out its commitments and obligations on schedule.

Some of the suburban jurisdictions are faced with similar constraints, in that their capital improvement programs, covering their full range of urban services, have resulted in high property taxes.

Several jurisdictions are now approaching their debt limits and increasing taxpayer resistance is being encountered in those projects which tend to increase property taxes.

The use of intergovernmental and interagency contracts and agreements has accomplished significant improvement in subregionalization of water supply and waste management. However, these efforts have not been successful in solving the management and environmental problems of the Region since they have not been coordinated through sound regional planning. Fragmentation in the handling of water and waste management functions has resulted in a duplication of services which have been neither cost efficient nor adequate from a regional standpoint. Such fragmentation has limited the metropolitan area's ability to realize the advantages derivable from a pooling of financial resources.

C. INTERACTIONS OF ENVIRONMENTAL PROBLEMS

Effective management of all environmental problems requires a recognition of the interactions between the various problems and other factors of our society. To assure that environmental control programs accomplish the desired objectives and that society's investment in such programs yields the highest possible return, it is absolutely necessary that full consideration be given to these interactions and interrelationships in planning and implementing such control programs.

Solutions to any one of the environmental problems have definite and far-reaching implications for the solution of the others. For example, the operation of currently proposed advanced wastewater treatment plants will produce sludge quantities far in excess of that produced by current conventional secondary waste treatment plants. The tremendous volume of sludge produced is, of course, a solid waste disposal problem. Current plans in the National Capital Region call for the incineration of this vast quantity of sludge in order to reduce its volume to manageable proportions. Incineration of these sludges will cause serious localized air pollution problems unless extremely efficient air pollution control devices are built into the incinerators. If these incinerators use a water spray to wash out fly ash from the stack emissions, the spent spray water itself is contaminated and must be treated before it can be discharged to the water source which the advanced wastewater treatment plant was designed to protect. Meanwhile, the problem of the disposal of incinerator residue on land remains.

Public health, water resources, and other officials are largely agreed that reclaimed wastewater may provide an increasing share of the Nation's water supply needs in the near future, based upon substantial experience which includes the use of reclaimed wastewater for industrial purposes, for recreation purposes and ground water recharge, and even for domestic water supply as in South Africa. Present studies aimed at determining the feasibility of using the Potomac Estuary for an emergency or supplemental water supply source point to the need for absolute assurances that all wastewaters reaching the Estuary have received the maximum feasible degree of treatment. In addition, however, other pollutants reaching the Estuary must be controlled; among these are agricultural, industrial, and municipal wastes generated above the water supply intakes both outside and within the National Capital Region; storm water and combined sewer discharges; solid wastes carried directly to the intakes by storm waters or through a ground and surface water route as leachings from disposal sites; chemicals, such as pesticides, and heavy metals from runoff; and sediment. Studies demonstrating the effect of the location of wastewater discharges point out that placement of wastewater discharges far downstream, to minimize opportunities for short circuiting, will result in an increasingly saline upper estuary which eventually would be unuseable as a water supply source.

The construction and operation of water supply and wastewater treatment facilities will create their own environmental problems. Site preparation may involve demolition with its resulting solid wastes, noise, and dust. Land clearing creates a potential for air pollution from burning and for erosion. Facilities construction may be a source of noise and vibration, air pollution from burning of construction materials, erosion, and sedimentation. Operational problems may include odors and noxious gases from any number of unit operations, airborne viral and bacterial agents, and air and thermal pollution caused by the need to generate power either onsite or elsewhere.

Air pollution regulations now going into effect in the Region will effectively eliminate small inefficient incinerators, requiring significant increases in public solid waste management investment. They have already forced a re-evaluation of municipal solid waste management practice by making recycling and landfilling comparatively more attractive.

The removal of airborne materials from waste gas streams has begun with equipment now available for removing particulate matter. Processes for the removal of sulfur oxide are in advance stages of development and demonstration. However, the primary means for controlling sulfur emissions over the next several years will be through the use of low sulfur fuels. The increased demand for this material has severely taxed industry's ability to provide it.

The implication of the course of action followed to solve the water supply, pollution control, and waste management problems of the National Capital Region are not limited to the interactions among these functional areas, but impact, or are impacted by, many other activities. Changes in land use or in transportation systems induce changes in development requiring adaptations of water resources plans and programs. Water and sewage facilities plans may be used to retard development or to guide it in publicly agreed upon directions. Such facilities may indirectly produce changes in other public facilities' plans and programs (such as police and fire protection, hospital and other health facilities, housing and recreation) through their ability to induce development. Construction and operation of virtually all public facilities impact the need for power, heat, industrial products, and solid waste disposal; alter water pollution control needs due to changes in domestic and industrial wastewaters, storm waters and combined sewage, and urban runoff; and create new demands for increasing quantities and quality of water supplies. Sites selected for water or wastewater conveyance or treatment facilities, or for solid waste disposal facilities will affect their use for other worthwhile purposes.

Programs carried out by local government and quasi-public agencies are impacted by water and related resources management programs. Economic development, urban renewal, and housing agencies depend upon adequate water, sewage, and solid waste disposal services. Health agencies must ensure safety in the provision of these services and use them to promote a healthful community. Recreation programs can be centered about a community water supply or completed solid waste landfill.

Proposed solutions to water supply and wastes management problems may advance or retard open space objectives. The tradition of locating water and wastewater treatment plants on shorelines has preempted the use of such sites for the recreation and open space purposes for which they are so well suited. Location of sanitary landfills on low cost marsh and wetlands can pollute the waters and destroy or drastically upset the ecology of the area. On the other hand, at very little cost chargeable to recreation programs, well selected sanitary landfill sites can be returned to open space and recreation uses upon completion of disposal operations. Local governments can preserve open space by withholding water, sewage, and solid waste services. Location of water supply and waste management facilities can foster environmental protection by discouraging flood plain development.

Public demand for an improved environment, which requires expenditures for upgrading existing inadequate facilities and programs and developing improved programs for the future, occurs simultaneously with demands for additional and improved programs in other functional areas, such as law enforcement, housing, and health care and with demands that taxes and other fund raising techniques be maintained at low levels. Clearly, economic conflicts will occur.

The costs of environmental quality control will require a regional commitment and the funding sources and techniques will have a substantial impact on the regional program. Water supply costs are raised in large part through local taxation and service charges with no significant state or Federal assistance with the possible exception of scale economies associated in such cases as Corps of Engineers multipurpose reservoir projects. Wastewater management funding sources include local, state, and federal agencies with funds derived in part from real estate taxes, connection fees, service charges, and state and federal income taxes. Solid waste disposal facilities are funded almost entirely by local taxes or service charges, although recent Federal legislation may allow a larger Federal participation in these programs. Costs of air pollution abatement are likely to continue to be borne by the polluter, who will pass on the cost of control in the price of his product. Air pollution regulatory programs are generally funded from local and state taxes. Recognition of the need for each involved agency to have its own organization structure for acquiring the necessary funds, and for administering its program, suggests that substantial administrative economies would result from the unification or consolidation of certain environmental functions, such as "wholesale" water supply, sewage disposal, and solid waste disposal services.

In the National Capital Region, as in other urban areas, the ability to raise funds to carry out public programs is limited, resulting in a competition for funds among the various urban programs. This means that water supply and waste management programs must compete with transportation, law enforcement, housing, and many other programs. Too often in the past, these environmental programs have suffered as a result of the higher priorities the public has placed on other program areas. Now, however, the public interest has turned toward environmental problems, and a deep public commitment has been made to solve some of them. The long years of inadequate attention to these problems has ensured that the cost of "catching up" and staying ahead of these problems will be large.

This discussion of the interactions of various phases of environmental quality management is evidence of the need for close coordination in the planning and implementation of quality control programs. It is obvious that the present fragmentation of jurisdictional responsibilities in these areas cannot achieve the required coordination to insure complementary environmental quality control programs. Present interjurisdictional plans for coordination and cooperation lack the commitment and legal binding to assure compliance with this requirement.

D. SUMMARY

This chapter has documented the growing seriousness of the water supply and waste management problems facing the National Capital Region. It has clearly shown that these problems cannot be solved by continued fragmentation of plans and programs. Furthermore, it has indicated that these environmental problems cannot be solved independently of one another--they affect, and are affected by, the entire range of other urban problems, all of which must eventually be approached in a unified manner.

Some of the impacts of the water supply and waste management problems and proposed solutions on health, on governmental and personal economics, on social well-being, on the political and legal structure, on open space needs, on agency inter-relationships, and on the environment have been noted. It is apparent that existing problems arise from a variety of causes, among which are both the rapid population growth of the region and the increasing standard of living which its inhabitants enjoy. Rapidly rising population creates rising demands for water, for liquid and solid waste collection and disposal capacities, and for goods and services which themselves create demands upon the environment in the form of air, water, and land pollution. The rising standard of living produces a per capita increase in goods whose production, use, and disposal all contribute to the region's environmental burden.

At the same time, the rapid rise in population and in the standard of living have resulted in explosive changes in land use, which reduce local government's ability to provide the public sites necessary to solve the water supply and waste management problems. Rapid population growth requires long range facilities planning to avoid costly, inefficient duplication in the future, but facilities designed for the long range are much larger than necessary today even though they must be financed from today's strained revenue base. The population growth aggravates other urban problems as well, creating conflicting demands for scarce public financial, human, and natural resources.

Water in the Potomac River during dry summer periods is in extremely short supply, and will result in more frequent restrictions on water use each summer if means cannot be found to increase such low river flows or to otherwise move water from areas of surplus to areas of deficit. Present plans to meet this problem consist of a water conservation policy adopted in 1966 and 1969 by MWCOG, a possible emergency Estuary pumping station, and a continuing effort to promote the construction of reservoirs in the Potomac River Basin. At present the opportunities for transfer of water among the major water purveyors of the region are inadequate. A major conflagration during a low flow period could have serious results. An accidental spill of toxic materials to the main stem or tributaries of any of the three major water purveyors of the region could result in an avoidable tragedy. Use of the Estuary as an emergency source of water would help solve the quantity problem for the Washington Aqueduct system but would not solve the quality problem in the event of a major spill of toxic materials.

Water pollution has caused nuisance conditions and health hazards on the Potomac Estuary, and has prevented the use of the Estuary for a variety of purposes. The Potomac Enforcement Conference, reconvened in 1969 to discuss the worsening water pollution problems and lack of conformance to its earlier recommendations, adopted stringent effluent standards for major treatment plants in the Region. A "Memorandum of Understanding" has been adopted by the conferees to speed the implementation of the Conference agreements. While a commitment to a high degree of wastewater treatment will improve the Estuary and enhance its water supply potential, other water pollution problems remain, some of which are beyond the capacity of wastewater treatment agencies to solve.

Only recently has man's environment been recognized as a precious natural resource, exhibiting characteristics of a flow resource which can only be managed on a sustained yield basis. The quantities of water available daily for use in the National Capital Region are limited. The atmosphere, the waters, and the land all have waste assimilation capacities (the rate at which wastes can be discharged to them without adverse effect) beyond which man dares tread only at the expense of environmental degradation. It is quite apparent that the Washington Metropolitan area has progressed beyond the capacity of its unregulated river systems to supply water. The reductions in air and water pollutants now being planned or implemented show that the National Capital Region has exceeded the assimilative capacities of its air and water resources. Finally, the rapid expansion of the suburban area and the inability to develop solid waste disposal sites suggests that the assimilation capacity of the land has been overestimated.

The assimilative capacities of the air, water, and land were reached and exceeded because both the private and public sectors of the economy viewed the environment as a common resource open to the use of all. As a consequence it became overused and subsequently degraded. The diversification of the receptors and the gradual nature of the degradation hampered the recognition of the problem. The result was a lack of regulatory authority, a lack of necessary funding, a lack of public interest, which combined with a lack of technical solutions, produced temporary, fragmented, single purpose approaches to the water supply and waste managment problems which overlooked the interactions of the many environmental programs with other urban programs.

It must be emphasized that increasing population growth in the National Capital Region will also mean increasing waste production. The problem is further compounded by the projection of increased per capita waste production in future years. The assimilative capacity of the Region to accept these wastes is essentially fixed, so that future waste management programs will require increasingly higher efficiencies. New solutions will be needed to effectively protect environmental quality. An approach such as recycling of waste may be the key to environmental quality control.

CHAPTER IV

THE SEARCH IN THE NATIONAL CAPITAL REGION FOR INSTITUTIONAL SOLUTIONS TO THE AREA'S REGIONWIDE PROBLEMS

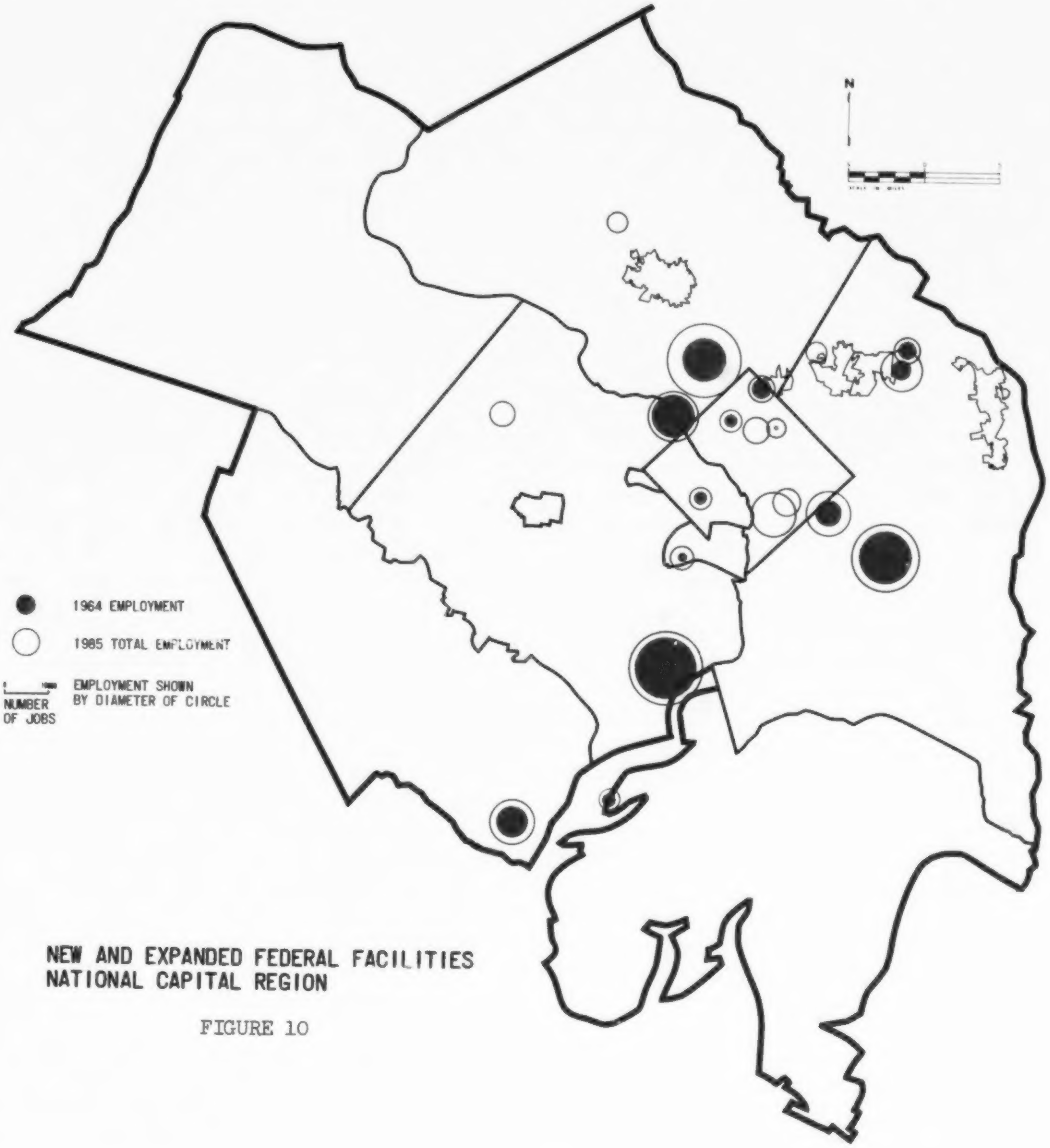
A. THE UNIQUENESS OF THE NATIONAL CAPITAL REGION

The search in the National Capital Region for institutional solutions to the area's regionwide problems has reflected the unique features of the Region. Some of these characteristics add to the complexity of governing the Region and the difficulty of finding and implementing effective institutional solutions. Other characteristics may in some respects simplify the governmental task.

Three features of the National Capital Region are particularly important in this regard. The first is the interstate nature of the Region, a feature which clearly makes the development of effective regional organization and concomitant policies more complex and difficult. Meaningful transboundary cooperation at the local level is essential in order to achieve regional solutions to areawide problems. A second feature is the presence within the Region of the National Capital. From that presence follows the determination, emphasized by all of the recent Presidents and repeatedly affirmed by the Congress, to make the area a model for the Nation and a demonstration to other nations of the American governmental system at its best. The Federal facilities associated with the National Capital also cause a significant impact on the development not only of the District of Columbia but also of the entire metropolitan area. One effect has been to aggravate difficulties at the non-Federal levels, particularly in county and municipal governments, in financing needed governmental facilities and services. This impact is growing rapidly, as depicted graphically in Figure 10.

The unique governmental characteristics of the District of Columbia are a third feature which add to the complexity and uniqueness of government in the National Capital Region. These include the special role of the Congress and the President in the governing of the District, its dual role as a State and city, and the provision by Federal agencies of a variety of municipal services.

The special role of the Congress and the President in the governing of the District includes their involvement in the enactment of laws applicable to the District and the levying of taxes to fund facilities and services provided by the District Government, and the District's financial dependence on funds appropriated by the Congress. The District's dual role as a city and a State refers to the fact that the District of Columbia, or Federal agencies acting for it, perform not only the functions of a municipality, but such functions of a State government as motor vehicle licensing, parole supervision and regulation


N
SCALE IN MILES
1964 EMPLOYMENT
1985 TOTAL EMPLOYMENT
0
EMPLOYMENT SHOWN BY DIAMETER OF CIRCLE
NUMBER OF JOBS

NEW AND EXPANDED FEDERAL FACILITIES
NATIONAL CAPITAL REGION

FIGURE 10

of public utilities. The provision by Federal agencies of certain municipal services includes such functions as the city's water supply by the Corps of Engineers, the services of the National Capital Planning Commission as the District's planning agency, the role of the National Park Service in developing and administering the park system, the administration by the Department of Health, Education, and Welfare of some Federal hospitals and institutions of higher education, and the administration by the Department of Transportation of two airports serving the Region.

B. INSTITUTIONAL FORMS WHICH HAVE BEEN UTILIZED

Against this background, the search within the National Capital Region for institutional solutions to regionwide water supply, waste management, and related problems has taken several forms.

Subregionalization

One form is the development of subregional organizations in major governmental subcomponents of the metropolitan area. For example, subregional comprehensive planning agencies in Maryland and Virginia have contributed substantially to the development and implementation of plans for regional approaches to the needs and problems of major portions of the National Capital Region. Similarly, the Washington Suburban Sanitary Commission in Maryland and the several water, sewer and sanitation districts and authorities in Virginia have achieved significant subregionalization of water supply and wastewater treatment programs in important parts of the metropolitan area. Subregional development also has been especially important in the provision of transit services.

Local Intergovernmental Agreements

Subregionalization also has facilitated effective use of a second form which regional coordination of water supply and waste management programs has taken in the National Capital Region. This is intergovernmental contractual arrangements between local units of government for the provision of these essential services. The following listing tabulates the principal uses of this approach at present:

1) For Water Supply

The District of Columbia agreement with Arlington County and Falls Church.

The contracts between the Fairfax County Water Authority and the Alexandria Water Company, Prince William Water Company, three sanitary Districts in Prince William County, and Fort Belvoir.

The contractual arrangements between the City of Fairfax and the Loudoun County Sanitation Authority and the Towns of Herndon and Reston.

Arrangements between the District of Columbia, the Washington Suburban Sanitary Commission, and the City of Rockville for cooperation in the event of emergency water supply conditions.

2) For Wastewater Treatment

The agreements between the District of Columbia and the Washington Suburban Sanitary Commission and Fairfax County for use of the Blue Plains wastewater treatment facility.

3) For Solid Waste Disposal

The contract between the City of Fairfax and Fairfax County.

Agreements between Fairfax County, Arlington County and the City of Falls Church.

MWCOG's Waste Management Agency.

The principal entity within the Region presently performing comprehensive planning for the entire metropolitan area also relies on the voluntary cooperation which characterizes the intergovernmental contractual approach. First in the form of the Washington Metropolitan Regional Conference, and subsequently in the strengthened Metropolitan Washington Council of Governments, this instrumentality has provided the participating governments with the advantages of a recognized regional forum for the discussion of mutual problems, the development of regional policy agreements, the benefits of the analysis and recommendations of a regionally-oriented staff, regional review and comment on local applications for Federal grants-in-aid, and the other values achievable through the COG-type of regional organization in metropolitan areas.

Intergovernmental Arrangements at the State Level

The National Capital Region also has developed regional solutions through formal intergovernmental arrangements at the state level. The most significant of these are the various agreements between the District of Columbia, Maryland and Virginia for regulation and provision of transit services and for the construction of highways and bridges. Also important are institutions established or proposed by the states in the Potomac River Basin for interstate cooperation in managing the Basin's water and related resources. Although not focusing directly on the metropolitan problems in the National Capital area, these uses of the interstate compact have strengthened regional cooperation in dealing with these problems and promise to do so further.

Regionalization Through Federal Action

The Federal Government has also acted to establish or encourage regional approaches to the problems and needs of the National Capital Region. In the case of water supply, waste management, and related programs, several types of Federal action have been especially significant. These include the Congressional authorization and funding of the Dulles Interceptor, the Federal effort to bring into being an effective planning institution for the National Capital Region, the in-depth analysis by Congress in the late fifties of metropolitan problems in this area by its Joint Committee on Washington Metropolitan Problems, and Federal intervention in the form of Federal-State enforcement actions to protect water and air quality in the environs of the National Capital.

Congressional Authorization and Funding of the Dulles Interceptor

In the present context, the special importance of the Dulles Interceptor is the use of Federal authority to make important regional policy decisions and to designate the agency to administer those decisions. Other significant aspects of this approach to regionalization are the role of Federal funding and the use of intergovernmental contractual arrangements to extend the geographic area in which regional cooperation would provide important benefits.

Federal Action to Strengthen Planning

Federal action to establish more effective planning in the National Capital Region resulted in the creation in 1952 by the Congress of the National Capital Planning Commission and the National Capital Regional Planning Council. Building on two predecessor agencies, the National Capital Park Commission (1924) and the National Capital Park and Planning Commission (1926), the Congress in 1952 designated the National Capital Planning Commission as the central planning agency for the Federal and District Governments. The Commission's basic function is to prepare, adopt, and periodically modify a comprehensive plan for the District of Columbia and the territory owned by the United States within the environs of the District. This long-range development plan includes, but is not limited to, generalized proposals for land use; major thoroughfares; park, parkway and recreation systems; mass transportation; and community facilities and services. A regionally important function of the Commission is its acquisition directly, or indirectly through grants to local park authorities in Maryland and Virginia, of land for the park, parkways and playground systems of the National Capital Region.

Also established in 1952 and functioning until replacement by the Metropolitan Washington Council of Governments in 1966, the National Capital Regional Planning Council was charged by the Congress with developing a general plan for the entire National Capital Region. In the present context, the significance of its creation is its reflection of Congressional recognition of the need for a regional planning institution with broader geographic jurisdiction than the National Capital Planning Commission and the Federal effort to bring such an entity into being.

Joint Committee on Washington Metropolitan Problems

Responding to an urgent need at the time, Congress in 1958, in the form of the Joint Committee, initiated an in-depth analysis of Washington Metropolitan problems. Although some of the findings and recommendations of the Committee's report may now be somewhat dated, many of the needs and goals which it identified still are relevant to the present study.

Recommendations by the Joint Committee of special importance to the present study include:

1) The strengthening of the Metropolitan Washington Council of Governments (then called the Washington Metropolitan Regional Conference) as the voice of the Region and as an instrument of expressing and safeguarding local interest.

2) The planning of a needed system of regional public works by a Regional Development Agency, which would be a Federal agency, established by Congress, and supported by Federal appropriations.

3) Construction and operation of regional public works in the fields of water supply, sewage disposal, and transportation by regional operating agencies established for this specific purpose.

4) Coordination of planning, operation and construction of water supply and sewage disposal facilities by a Regional Sanitary Board consisting of representatives from regional and subregional agencies, the District of Columbia, the Corps of Engineers, and the health officers from the District of Columbia, Maryland, and Virginia.

5) Expression of the Federal interest in the National Capital Region and its orderly development in a policy declaration by the Congress which would establish the foundation for a broad legislative program.

6) Establishment of a coordinator for National Capital Affairs in the Executive Office of the President.

7) The strengthening of comprehensive planning in the District of Columbia through a planning agency reporting directly to the Board of Commissioners.

8) Establishment by Congress of a metropolitan fiscal agency which would have power to issue bonds guaranteed by the United States Treasury in an amount to be determined by the Congress, to finance all regional public works.

As a direct result of the Joint Committee's recommendations, the Congress in 1960 enacted the Washington Metropolitan Region Development Act (P.L. 86-527). This Act declares that it is Congressional policy to require the executive branch of the Federal Government and the government of the District of Columbia to exercise their functions, powers, and duties with respect to the National Capital Region in a manner which will facilitate the attainment of coordinated development in the metropolitan area and thus contribute to the solution of the area's problems. Of special significance to the purpose of the present study is the directive in the Act that priority was to be given to"... the solution, on a unified metropolitan basis, of the problems of water supply, sewage disposal, and water pollution and transportation."

Federal Enforcement Actions

The Potomac River Enforcement Conference

The tidal character of the Potomac at Washington and its tendency to retard the rate that pollutants are dispersed has made the river a victim of the conflict between population growth and weaknesses of the current subregional waste disposal programs. As a result, the Potomac River in the Washington Area has been the subject of formal enforcement action under the provisions of the Federal Water Pollution Control Act since 1957.

The enforcement conference has been successful to a degree in achieving coordination in planning for provision of the high levels of treatment necessary to meet the water quality requirements and action schedules established by the conferences. However, progress in planning for the Region's biggest polluter, the District's regional waste treatment facility, was delayed until the involved jurisdictions developed a "Memorandum of Understanding" in late 1970 which laid the basis for upgrading this facility. Again it was necessary to use the enforcement conference to effect this agreement. Although the agreement permits action to begin on a large portion of the municipal waste treatment problem, it does not address the problems of storm drainage, combined sewage overflow, discharges of raw sewage occurring daily in the Region, sediment control, or unrestrained development and the resultant building moratoria. As such, the memorandum falls short of providing the kind of comprehensive planning necessary in the Region.

Air Pollution Enforcement Conference

Serious air pollution problems forced the Secretary of Health, Education, and Welfare in 1967 to call an enforcement conference to consider those problems. The conference concluded that pollutants discharged into the atmosphere in the District of Columbia, Maryland, and Virginia are transported into neighboring jurisdiction "subject only to the vagaries of wind and weather," and that such air pollution adversely affected visibility; damaged vegetation; caused deterioration, damage, and destruction of materials, increased economic costs in the community for air conditioning and cleaning; and adversely affected the health of the citizens of the Region. Among the institutional deficiencies noted by the conference were the absence of a fully satisfactory mechanism to coordinate the development of a comprehensive air quality control plan for the Region, to prepare emergency protective procedures, and to secure uniform regulations and enforcement throughout the metropolitan area.

C. UNRESOLVED ORGANIZATIONAL WEAKNESSES AND DEFICIENCIES

Utilizing the institutional forms reviewed in the previous section, the governments in the National Capital Region have developed important subregional institutional arrangements for water supply and waste management services. They thus have resisted, with remarkable and commendable success, the widespread general tendancy in the Nation's metropolitan areas toward fragmentation of governmental organization and authority. Writing in 1958, the staff to the Joint Committee on Washington Metropolitan Problems could report that the National Capital Region ". . . still has only 67 units of government, and many of these are special districts and municipalities with limited powers." With justification, therefore, that report could conclude that in this regard the National Capital Region compares extremely well with other metropolitan areas in the country. It also, again justifiably, could comment favorably on the fact that the number of governmental units in the National Capital Region at that time was not much greater than it had been several decades earlier. Both conclusions would appear to be equally valid today.

It is equally clear, however, that the need for Federal intervention in the affairs of the National Capital Region, particularly in the form exemplified by the Dulles Interceptor, the efforts to create effective regionwide planning, and Federal-State enforcement actions to abate water and air pollution, is evidence of deficiencies in present institutional arrangements at the local and State levels for achieving regional solutions to the areawide water supply and waste management problems of the Region.

Fragmentation of Governmental Organization for Water Supply and Waste Management

A major weakness and deficiency in the National Capital Region's present institutional arrangement for water supply and waste management is the fragmentation of governmental organization and authority which remains. Commendable as the Region's record has been in resisting further fragmentation, effective application of regional solutions to areawide water supply and waste management problems remains too dependent upon intergovernmental contractual agreements and other forms of voluntary cooperation. As a result, sound regional approaches in all of these programs are too easily frustrated by a single jurisdiction's refusal to cooperate.

In the case of water supply, the multiplicity of agencies and plans for provision of this service impedes sound development of new water supply sources and will increasingly handicap such development as existing supplies of raw water in the near future reach the limit of their development. In all of these programs, it has prevented the Region from achieving important financial savings through the realization of economies of scale in securing needed credit, in the construction of facilities, and in operating programs. Also, regional funding to meet the high cost of technology now under development for the recycling of solid wastes will become increasingly essential in the near future, and, therefore, failure to correct the Region's presently fragmented arrangements for solid waste disposal would prove particularly deleterious.

A related organizational weakness and deficiency is the separation of programs to provide water supply from waste management programs and, closely related, separation at the operating level of waste management programs from related service or resource management programs, notably the planning and control of land use. The result has been a tendency toward "tunnel vision" in all of these programs. Within environmental service and protection programs, this tendency has added immensely to the difficulties of effectively integrating treatment and disposal of the Region's liquid and solid wastes and to the problems of integrating both of these programs with the control of air pollution. The separation of water supply and waste management also has contributed to the water quality problems in the upper Potomac estuary because of lack of coordination between the scheduling of needed waste treatment facilities and the expansion of water supply services. In the case of wastewater management, the failure to relate the capacity of treatment facilities to the expanding residential and other development of the Region has compelled State authorities to impose costly moratoriums on the construction of housing in some of the suburbs. It also has created adverse environmental conditions in parts of the Region because of the inability to properly resolve problems caused by the failure of private septic systems.

The Lack of An Adequate Regional Planning Mechanism

Another unresolved institutional weakness at present is the lack in the regionwide planning mechanism of the ability to ensure adherence to regional plans and priorities. Given the fragmentation of governmental organization and authority and the separation of related programs which now characterize the Region, such a mechanism is essential if regionwide solutions are to be successfully applied to the water supply, waste management, and related problems of the metropolitan area.

It is important to point out that the recommendation in 1959 by the Joint Committee to establish the Regional Development Agency at the Federal level to develop a plan for a needed system of regional public works was never implemented. With the demise, therefore, of the National Capital Regional Planning Council in 1966, regional planning in the sense of areawide and comprehensive planning since that time has been the responsibility of the Metropolitan Washington Council of Governments. Although the Council of Governments has attempted to provide such planning, the voluntary nature of the association on which it rests and its lack of authority to implement planning decisions have restricted it largely to an advisory role. Valuable as this role has been, it cannot fill the need within the Region for an institution capable of combining planning in program areas requiring regionwide solutions with the authority to make binding policy decisions and assure the implementation of those decisions.

CHAPTER V

THE MAJOR ALTERNATIVES AVAILABLE TO THE NATIONAL CAPITOL REGION

A. ORGANIZATIONAL ALTERNATIVES AS PRESENTED IN TWO RECENT REPORTS

Two recent reports present organizational alternatives for strengthening water supply and waste management programs in the National Capital Region. One is a staff paper prepared by the Middle Atlantic Regional Office of the Water Quality Office of the Environmental Protection Agency, as a part of its studies for the conferees of the Conference on Pollution of the Interstate Waters of the Potomac River and Its Tributaries, Washington Metropolitan Area. The other, also undertaken recently but independently of the above report, is a study by the Institute for Defense Analyses.

Because of its judgment that these two documents identify most of the alternatives available to the Region for this purpose, the Environmental Protection Agency has chosen not to make its own detailed analysis of the alternative possibilities. In lieu thereof, the two reports have been attached as Appendix A and B, respectively. This chapter begins with a brief review of the alternatives which they identify.

Water Quality Office Report

The Middle Atlantic Region's staff paper, "Examination and Evaluation of Existing and Alternative Institutional Arrangements for Water Quality Management in the Washington Metropolitan Area,""considers four basic alternatives for the provision of water supply and water pollution control facilities at the Metropolitan Area level. The problems of solid waste disposal and air pollution control were not within the scope of the paper, but the institutional alternatives presented for water quality management could also be used to attack those problems on a regional basis. Legislative changes would be needed to create any one of the four basic alternatives presented.

Washington Metropolitan Area Water and Sewerage Authority

The creation of this regional service agency with limited governmental powers requires an interstate compact between Virginia, Maryland, and the District of Columbia, and Congressional approval of the compact. The Authority would provide wholesale water supply and sewage disposal services to the local governmental units. The local units would retain control of their water distribution and sewage collection systems. The Authority could be created to include solid waste disposal and air pollution control among its services. For financing, the Authority would have to rely on revenue bonds and the existing Federal grant programs.

This Authority could be modeled after the existing Washington Metropolitan Area Transit Authority which, although created at the State level, is an area level organization with the governing Board of Directors being appointed from local, rather than State governmental units. Northern Virginia, Suburban Maryland, and the District of Columbia could each appoint two directors to a six-man governing board. The District of Columbia directors could be appointed by, and from, the City Council. The Suburban Maryland directors could be appointed by, and from, the Washington Suburban Sanitary Commission if it were expanded to include Charles County (assuming that Charles County would be part of the Authority's service area). Ideally the two Northern Virginia directors would be appointed by, and from, a Northern Virginia Service District Commission which is not yet in existence.

Significant advantages of this alternative are the retention of local control and compatibility with both the present and possible future governmental structures in the Metropolitan Area. In the future, this Authority could be combined with the Transit Authority and form the nucleus for a multipurpose regional service authority providing additional areawide services.

Regional Water and Sewerage Authority with State Membership

This alternative would be identical to the above Washington Metropolitan Area Water and Sewerage Authority or Waste Management Authority except that the Governors of Virginia and Maryland and the Mayor-Commissioner of the District of Columbia would each appoint two residents of the local area to represent Northern Virginia, Suburban Maryland, and the District on a six-man governing board. This change to State-appointed directors would make the regional water and sewerage authority a creature of the States rather than of the local governments.

As with the other alternatives, most factors concerning this authority could be viewed either as an advantage or disadvantage. For example, the appointment of directors by the Governors could be viewed as removing the directors from local pressures for quick or preferential development of water and sewerage facilities. Opponents of this alternative could say the gubernatorial appointments greatly reduce the political accountability and responsiveness of the Authority. In addition, the Authority's State-level character would not be compatible with the present scheme of government in the Metropolitan Area.

A Multipurpose Regional Government

Because of public resistance, the provision of wholesale water and sewerage services by a multipurpose regional government formed under an interstate compact should probably be considered as a long-range alternative. However, it should not be lost sight of by those organizing an areawide water and sewerage agency. In 1957 voters in the Seattle, Washington, area rejected a plan for a regional approach to sewage disposal, public transportation, and planning; but they then approved a regional approach to sewage disposal alone, because water pollution was at a crisis level. The voter approval created the Municipality of Metropolitan Seattle with 14 member jurisdictions. At present the Municipality of Metropolitan Seattle only has the single function of sewage disposal, but its structure is elastic enough to take on other functions when the voters give their approval. The main point to be made here is that the structure of an areawide water supply and sewerage agency or waste management agency could be flexible enough to either fit easily into a future regional government or to take on other functions and be the core of a future regional government. Long-range alternatives should be kept in mind when formulating shorter term solutions.

A Federal Water and Sewerage Authority

The Federal Government could create an authority patterned after the Tennessee Valley Authority (TVA) to operate all the water supply and sewage facilities in the Washington Metropolitan Area. If the TVA pattern were followed, the Federal authority would initially be financed by revenue bonds guaranteed by the United States Government. This is a major advantage of the Federal authority. However, the TVA pattern would also call for a Presidentially appointed three-man governing board, and this would almost completely insulate the authority from any political accountability to the residents of the Metropolitan Area. Suggestions as to the appointment of directors and testimony at mandatory public hearings on important issues would be the only means of local influence. The Federal Authority is also structurally incompatible with the existing and possible future scheme of government in the area.

Institute for Defense Analyses Report

The Institute for Defense Analyses study, "An Analysis of Alternative Institutional Arrangements for Implementing an Integrated Water Supply and Waste Management Program in the Washington Metropolitan Area" is appended as Appendix B. The alternative institutional arrangements which it reviews and the report's recommended approach are summarized below.

Interstate Commission on the Potomac River Basin (INCOPOT)

INCOPOT was created in 1940 by an interstate compact among the States of West Virginia, Pennsylvania, Maryland, Virginia, and the District of Columbia for the purpose of regulating, controlling, preventing, or otherwise rendering unobjectionable and harmless, pollution in the Potomac River Basin. Its 18-member Commission consists of three members appointed by the chief executive in each of the five signatories plus three appointed by the President of the United States. The

Commission, with the approval of at least two of the three commissioners from affected States, may make recommendations on plans of public or private agencies affecting the pollution of the Potomac River.

A 1970 compact amendment has lifted some financial restrictions on INCOPOT's funding sources and may permit a doubling of staff to six persons. Other amendments enacted at the same time: 1) broaden the scope of INCOPOT's authority to include water resources and associated land resources, 2) allow the Commission to provide liaison among public and private agencies in the formulation and coordination of plans relating to the development of water and associated land resources in the basin, and 3) allow the Commission to establish "sections" for the purpose of dealing with problems of pollution and of water and associated land resources in specific areas which directly affect two or more signatories.

Metropolitan Washington Council of Governments (MWCOG)

MWCOG was formed in 1957 as a nonprofit corporation empowered to advise and assist local governments of the region and 1) to identify mutual areawide problems, 2) to develop and promote a comprehensive regional plan, 3) to seek mutually desirable policies and develop cooperative mechanisms among local governments, 4) to support and promote concerted action among the local governments, and 5) to serve at the request of local government as their representative on regional matters.

Membership in MWCOG includes 15 major local governments: the District of Columbia, six Maryland and Virginia counties, and eight cities. All elected officials of these jurisdictions, District commissioners and councilmen, and all the Maryland and Virginia State legislators and congressmen representing portions of MWCOG's jurisdiction, constitute the general membership. Also, all members of the District committees of the Senate and House are included. The general membership consists of 175 persons whose terms of office coincide with the terms in their respective jurisdictions and who meet annually to approve MWCOG's approximately $2 million budget and programs.

Between annual meetings, a 19-member board of directors acts on behalf of the organization by preparing policy recommendations and making budgetary decisions. MWCOG does not have authority to legislate, regulate, or tax, and individual Council members or their governments can oppose a proposal or withdraw from MWCOG whenever they choose. Moreover, no community is bound by its member's vote either in the general meeting or on the board of directors.

MWCOG employs a staff of approximately 100 persons about equally divided between professional and clerical personnel. It derives approximately 70 percent of its budget from Federal grants, primarily from the Department of Housing and Urban Development, and is confined in the use of this money to the categorical purposes for which it is given. One of its principal functions is to review and comment on some 50-odd local government applications for Federal grants and loans as required by Federal legislation and executive order.

Maryland Environmental Service (MES)

MES, which became operational in July 1970, was created by State statute to provide dependable and efficient purification and disposal of liquid and solid wastes throughout the State of Maryland. The Service is organizationally located within the Department of Natural Resources and has its three officers appointed by the Secretary of the Department with the approval of the governor. The Secretary retains the power to remove all three officers and the right to approve its policies and procedures. His authority is somewhat circumscribed by enabling legislation prohibiting his transferral of MES functions, staff, or funds.

As a statewide wholesale sanitary district, MES specifically has authority to 1) plan, integrate, and establish planning regions and financing districts for both services; 2) acquire (through eminent domain), construct, and operate wastewater and solid waste facilities within or without Maryland; 3) borrow money and issue revenue bonds to finance its projects; and 4) charge and collect fees for the use of services furnished by its projects.

Because MES is primarily an administrative agency, ample safeguards have been established to assure that policy decisions remain in the hands of local governments. To illustrate, MES will base its 5-year plans on the needs of the counties as outlined in their state-approved 10-year master plans for these services. Its 5-year plan for a region cannot be adopted until each of the governing bodies of the affected counties has approved it. Should the plan not receive their unanimous approval within four months, only a joint resolution of the Maryland General Assembly can allow the plan to be adopted.

The Service may provide projects in two types of situations: 1) when a municipality or firm is unable or refuses to effectively respond to an order to abate pollution issued by another state agency, or 2) in response to a municipality's request for MES to provide wastewater purification or solid waste disposal facilities for its jurisdiction. The Service directors operate independently from the Department of Natural Resources in the issuance of revenue bonds to finance the facilities, and the municipality is then charged on the basis of a formula reflecting the volume and characteristics of the wastes received by the facility--with MES guaranteed the municipality's allocation of State-shared taxes in case the municipality defaults on its obligations.

Enabling legislation specifically states that unless it gains the municipality's consent, MES does not have the authority to interfere or restrict the operations of existing projects which the Secretary of the Department of Health and Mental Hygiene determines are being adequately administered, and the construction of new solid waste disposal projects by MES is expressly prohibited without the consent of the governing body of the municipality concerned. Finally, the zoning and land-use planning functions of municipalities are not to be compromised in exercising the Service's responsibilities.

Potomac River Basin Commission (PRBC)

The PRBC would implement the provisions of the Federal-interstate compact recommended by the Potomac River Basin Advisory Committee in 1968 and, as its name indicates, exercise powers throughout the Potomac River drainage basin. The Commission would consist of six commissioners: four State governors, the Mayor-Commissioner of the District of Columbia (or their designees), and an appointee of the President.

The purpose of the Commission would be to provide for the planning, conservation, utilization, development, and management of water resources of the basin through intergovernmental cooperation at all levels among basin jurisdictions. Services with which it would be concerned are water supply, water quality control, flood protection, watershed management, water-related recreation, preservation of the river's environmental amenities, wholesale hydroelectric power, and emergency water rationing.

Agencies and local governments of the signatories would be used whenever possible and they, in turn, could contract with PRBC to implement aspects of the Commission's program or for the acquisition, development, and operation of park, recreation, scenic and historic areas, or for the collection and disposal of solid wastes, or to control, abate, and prevent air pollution. The Commission would develop a Comprehensive Water Resources Plan, outlining all the public and private projects required to satisfy optimum water resources development, conservation, and utilization needs, along with a water resources program to implement it.

The Commission would be empowered to acquire, finance, contract, improve, operate, and regulate projects needed to carry out its responsibilities for the above services. It could temporarily control withdrawals during periods of water shortage, provide technical and financial assistance to existing governmental agencies to implement its plan, do research on water resource problems, and initiate actions to compel compliance with compact provisions or any rules and regulations adopted by the Commission.

The PRBC would also be empowered to prepare a Comprehensive Amenities Plan and programs for the development and preservation of aesthetic, scenic, and historic values along the Potomac which shall provide for 1) river zones, 2) land-use plans and controls within them, and 3) acquisition of existing and potential aesthetic, scenic, and historic areas within these zones. The Commission may not establish such zones until the commissioner from the affected signatory has voted for its establishment.

Annual capital and operating budgets, including the apportionment of costs among the signatories, would require a unanimous vote of the Commission. Funding for its projects would also include the power to issue revenue bonds financed by user charges and special assessments. Through 1970, the compact had been adopted only by Virginia, which amended it by restricting the PRBC to the making of recommendations regarding the implementation of its Amenities Plan and by stipulating that prior to 1980 the Commission shall not aid local agencies in developing comprehensive plans for river zones or freeze existing land-use in these zones until the PRBC accepts adequate zoning and land-use controls.

Metropolitan Washington Waste Management Agency

The Waste Management Agency, created in 1967 as a service corporation to operate under the auspices of MWCOG, has yet to begin actual operations. Its objectives are 1) to identify mutual areawide problems concerning the treatment, utilization, and disposal of liquid and solid wastes, 2) to develop along with local governments a metropolitan waste management plan and program, 3) to develop cooperative arrangements among local governments for implementation of a metropolitan waste management plan and program, and 4) to acquire, develop, and manage facilities for such a program under contract to local governments.

Its boundaries coincide with those of MWCOG, and its board of directors consist of members of the MWCOG board plus its Health and Environmental Protection Policy Committee. Decisions of the Corporation will in no way be binding upon the governments represented on its board. Revenue bonds issued by the Corporation can be amortized by fees and charges to jurisdictions benefiting from its services and facilities. It is anticipated that the Agency will become operational some time during fiscal year 1972.

The Washington Metropolitan (Metro) Council

Based on the strengths and inadequacies of the institutions analyzed, a model was developed which attempts to combine these insights with the operational experience of the Twin Cities Metropolitan Council in Minnesota. The resulting structure (which would be permanently created by interstate compact) would be a two-tiered governmental system consisting of a Washington Metropolitan Council and local units of government. The Metro Council would exercise planning, financing, construction, and operation functions on a wholesale basis for water supply, sewage treatment, and solid waste services, and it would have authority to do planning and some financing in the field of air pollution abatement.

The governing board of the Metro Council would consist of 15 members (representing the same 15 local jurisdictions included in the Metropolitan Washington Council of Governments) elected at-large from each of the jurisdictions to serve for six-year overlapping terms. Council decisions would be made by a 100-vote weighted voting system based on the population residing in each municipality. Official Federal, State, and basinwide interests could be recognized by permitting a representative from each of these jurisdictions to sit on the governing board in a nonvoting capacity.

Council authority to implement areawide policies for these services would be delegated to three service districts, i.e., the Northern Virginia Service District, the Washington Suburban Sanitary District, and the District of Columbia, which would have to receive Council approval for any project substantially affecting the metropolitan area. However, local governments would retain control over such nonregional services as water distribution, sewage collection, and refuse collection.

The Metro Council would also be aided by single-service technical advisory boards composed of nine experts from specific fields. These experts would be appointed by the Council to serve part-time for three-year staggered terms, with one representative chosen from Maryland, Virginia, and the District of Columbia each year. The District of Columbia's representation would therefore always constitute one-third of a board's membership in explicit recognition of its unique role as both the State and the central city upon which the rest of the metropolitan area focuses. None of the other municipalities would be permitted to have more than one representative on an advisory board at any given time. Initially, board chairmen would be designated by the Council to serve for three years; subsequent chairmen would be chosen by the boards from their own membership.

B. TWO ADDITIONAL ALTERNATIVES

Not identified by these two studies are two additional alternatives. These are the use of the District of Columbia as the nucleus for achieving regionalization of water supply and waste management programs and the enlargement of the authority and responsibilities of the Washington Metropolitan Area Transit Authority.

The suggestion to use the District of Columbia as the vehicle for achieving regionwide coordination of water supply and waste management is based on the precedents in the Congressional authorization for the Dulles Interceptor. Public Law 86-515, enacted by Congress in 1960, authorized this facility and for this purpose established a number of regionally important organizational and funding arrangements. These included (1) a direct Federal grant for planning, right-of-way acquisition, and construction: (2) authorization of a United States Treasury loan for the remainder of the construction costs; (3) designation of the District of Columbia Commissioners to plan, construct, operate, and maintain the sewer in cooperation with other jurisdictions; and (4) creation of a Metropolitan Area Sanitary Sewer Works Fund in the District of Columbia as a separate and special account. As a further move to make regional use of the facility, the Act also authorized connection with the Interceptor by areas in Maryland and Virginia tributary to the region through which the facility passes.

Basically, therefore, this alternative proposes to regionalize water supply and waste management through Congressional policy decisions, by making the District of Columbia the administering agent to execute those decisions, and by relying heavily on continuation of intergovernmental contractual arrangements to secure the benefits of regional cooperation.

In the present context, this proposal would also have the Washington Aqueduct transferred to the District of Columbia to strengthen its potential role as the nucleus around which regional integration of water supply and waste management can be achieved.

The other alternative, the possibility of utilizing the Washington Metropolitan Area Transit Authority, envisions the use of an existing intergovernmental agency in the National Capital Region below the Federal level to effect regionalization of water supply and waste management. Support to this possibility is given by Title III of the National Capital Transportation Act of 1960. This section, which gave advance consent to the negotiation of the compact creating the Transit Authority, specifically gave Congressional encouragement to the establishment of an intergovernmental agency which would perform governmental functions of a regional nature other than the provision and operation of transportation facilities only.

C. THE ALTERNATIVES RESTATED AND EVALUATED

The Alternatives Restated

One of the most crucial issues to be decided in establishing any new regional entity in the National Capital Region for water supply and environmental protection is the question of whether control over the agency is to be exercised locally, at the state level, or by the Federal Government. Grouped according to these three broad possibilities, the organizational alternatives which Appendix A, Appendix B, and this chapter have identified fall into the following categories:

Locally-Controlled Alternatives

- Metropolitan Washington Council of Governments
- A local special district
  - COG's proposed Waste Management Agency
  - A special statutory water and sewerage authority
  - Assignment to the Washington Metropolitan Area Transit Authority
- Washington Metropolitan Council (the IDA proposal)
- A multipurpose regional government

State-Controlled Alternatives

- Interstate Commission on the Potomac River Basin
- Maryland Environmental Service
- Potomac River Basin Compact (or the regional water and sewerage authority with state membership)

Federally-Controlled Alternatives

- A Federal water and sewerage authority
- A strengthened District of Columbia with Congressionally provided regional responsibilities and authority

Criteria for Selecting Institutional Arrangements

The institutional and financial recommendations presented in the next chapter are based on eight criteria which, in the judgment of the Environmental Protection Agency, should control the selection of the alternative to be applied to the needs of the National Capital Region.

These criteria are the following:

1. Ample legal and administrative authority to directly or indirectly (i.e., through other entities) integrate environmental protection programs in the National Capital

Region and effectively coordinate these programs with the provision of water supply.

This criterion requires that any new institutional arrangements to be established in the Region have the authority not only to plan but also to finance, construct, and operate needed regional water supply and waste management facilities.

2. Ability to exercise this broad authority throughout the entire metropolitan area.
3. Ability to effectively influence other service or resource management areas - for example, land use, development of open space, and economic development - which affect or are affected by water supply and environmental protection programs.
4. A degree of financial self-sufficiency which permits adoption of a perspective which is regionally-oriented.
5. Responsiveness to democratic controls and accountability to the public at large.
6. Sufficient compatibility with the existing governmental institutions in the metropolitan area to be a politically feasible instrument for performing municipal functions.
7. Recognition of, and adequate provision for, the Federal Government's special interest in the national Capital Region.
8. Consistency with the objective in the President's New Federalism of vesting decision-making authority in state and local authorities.

Evaluation of Alternatives

Table 5 presents an evaluation of the eleven organizational alternatives based on these eight criteria. An x denotes a judgment by the Environmental Protection Agency that the degree of compliance with the criterion is substantial and therefore adequate.

Table 5

EVALUATION OF ALTERNATIVES

	Local Control						State Control			Federal Control	
		Local Special District									
Criterion	COG	COG's Proposed Waste Mgt. Agency COG	Special Statutory Water and Sewerage Authority	Use of Transit Authority	Metro Council	Regional Gov't	INCOPOT	Md. Env. Serv.	Potomac River Basin Com. PRBC	Federal Auth.	District of Columbia
Ample legal and administrative authority to integrate environmental services programs			x	x	x	x		x	x	x	x
Jurisdiction over the entire metropolitan area	x	x	x	x	x	x				x	x
Ability to influence related programs					x	x			x		
Reasonable financial self-sufficiency	x	x	x	x	x	x		x	x	x	x
Democratic controls and public accountability					x	x					
Political feasibility	x	x	x		x		x				
Recognition of special Federal interest					(1)		x		x	x	x
Consistency with the New Federalism	x	x	x	x	x	x	x	x	x		

(1) Does not meet this criterion, but see provision for this in adaptation recommended in this report

CHAPTER VI

RECOMMENDED INSTITUTIONAL AND FINANCIAL ARRANGEMENTS

A. THE NEED FOR NEW ARRANGEMENTS

Two facts underscore the need for immediate action in the National Capital Region to strengthen institutional and financial arrangements for provision of water supply and waste management. The first is the critical problems now confronting the Region in environmental protection and service programs. The second is certainty that the failure to act now will not only aggravate problems as the Region continues its developement as one of the fastest growing metropolitan areas in country but ultimately will also add to the financial cost of solutions to those problems.

Major weaknesses in the Region's present system for providing water supply and for protecting the environment are institutional and financial rather than technical or engineering. The major deficiencies are four. First, until recently, there has been a strong tendency to underestimate or, even worse, to ignore ecological and environmental impacts of water resource, waste management and other urban development decisions in the Potomac area. The consequences have been extremely adverse and have seriously reduced the usefulness of the Potomac Estuary to the people in the National Capital Region and to the people of the Nation. Fortunately, this attitude is changing rapidly, but the Region still shows signs of reluctance to accept all the ramifications of adequate environmental protection programs. Illustrative of this are the low priority many still accord financing arrangements for essential new waste management facilities, problems in coordinating sewage system extensions with treatment plant capacities, and problems in coordinating solid waste disposal with the development of open space. Additional evidence of this is the reluctance to recognize the impact which land use and other development policies have on the ability to implement established water and air quality standards.

A second major weakness is the lack of authority in the existing regional agency for comprehensive planning to achieve adherence to regional priorities and plans. Barring corrective action, at least as it pertains to water supply and waste management programs, this void will result in periodic water supply shortages and recurrent Federal intervention in the form of enforcement actions to achieve essential environmental goals in water and air quality. It also would perpetuate the disorderly development of the National Capital Region which is evident in undesirable and continuing urban sprawl, in most instances contrary to land use plans of the local jurisdictions; past and present sewage service and development moratoriums made necessary by the lack of adequate wastewater interceptor and treatment capacity; and other adverse effects of uncoordinated planning and inadequate consideration of the impacts of interreacting public and private programs. In the long run, the financial burden of less than regional solutions to regional problems also is bound to prove needlessly costly.

A third and two fold weakness is the separation of programs for water supply from waste management programs and the multiplicity of organizations and plans for providing water supply and waste management. Separation of water supply and waste management programs, along with the tendency to underestimate or ignore ecological and environmental impacts of waste disposal practices, has prevented the use of the upper estuary of the Potomac as a water supply source and today continues to delay this potential use. The multiplicity of agencies and plans providing water supply impedes sound development of new sources and will become increasingly serious as existing supplies of raw water in the near future reach the limit of their development. It also has prevented the Region as a whole from achieving important financial savings in all of these programs through the realization of economies of scale in obtaining credit for capital improvements and in the construction and operation of facilities.

The latter is particularly true in solid waste disposal where regionwide operations will be essential as the metropolitan area expands and the choice narrows between alternative solutions to its waste management problems. Recycling of solid wastes, a technically feasible alternative to incineration or landfills, will probably be the best choice in the future but will be economically feasible only when adopted on an integrated regionwide basis.

Inadequate and uncertain funding of environmental protection programs, especially for waste management and particularly so in the case of the District of Columbia, is the fourth weakness. This deficiency has proved especially serious, because it has adversely affected the District's ability to make necessary improvements to its wastewater interceptors and treatment facilities, key components of which serve a regionally-important role. The weakness is due to the District's dependence on the Treasury for borrowing purposes and on legal restrictions which adversely affect its ability to utilize accumulated revenue from service charges and to carry out contractual obligations and commitments on schedule.

Correction of these institutional and financial weaknesses calls for a variety of actions. One is the integration of water supply and waste management programs with land use and other related matters which should affect these programs, and should be affected by them. Basically, this requires the effective linking of regionwide planning for water supply and waste management to the planning of programs in related service or resource management areas. It also requires the conversion of the Region's present strictly voluntary and advisory approach to regional planning in these areas to one capable of assuring implementation of regionally-developed and regionally-approved plans. Another essential action is the consolidation of wholesale facilities for water supply and waste management in order, first, to effect coordination among these interacting services and, second, to realize economies of scale possible through regionalization of such facilities. Also essential is correction of deficiencies in existing financial arrangements. Especially desirable in this regard is enactment of the President's recent proposal to change the District's use of Treasury borrowing for funds for capital improvement programs through authorization of taxable municipal revenue bonds with a Federal guarantee and an interest subsidy.

B. A RECOMMENDED DUAL STRUCTURE AND TWO POSSIBLE ALTERNATIVES

Correction of the present institutional weaknesses in the National Capital Region for water supply and waste management can best be achieved through a dual regional structure at the level of local government and created by interstate compact:

1. A Regional Council for comprehensive planning and policy decisions in water supply and waste management programs for the Region.

2. An Environmental Services Corporation, which would function under the Council's direct supervision, for acquiring, constructing, and operating wholesale water supply and waste management facilities for the Region.

The Regional Council would be the instrument for a two-way, interacting link between the areawide planning and policy aspects of water supply and waste management and those of other programs which should affect, and should be affected by, such plans and policy decisions. Because the Corporation would be placed under the Council's supervision, the dual structure would have the effect of unifying and integrating the overall governmental framework of the Region rather than creating further fragmentation.

The compact would be expected to spell out the details of the structure, powers, and duties of both agencies. Such details as this report includes have the purpose of describing the general nature of the Council and Corporation as they could be organized and the functional relationship between the two agencies. These details, it is emphasized, do not constitute definitive recommendations on how the Council and the Corporation should be organized.

Although less satisfactory, two alternative possibilities could achieve some improvement in the Region's present institutional arrangements for water supply and waste management. The first of these is a Federally established corporation which would immediately take over and operate the wholesale water supply and waste management facilities of the Corps of Engineers and the District of Columbia Department of Sanitary Engineering. It also would take over and operate additional similar facilities in the Region either with the concurrence of the jurisdiction now operating the facility or through the exercise of a congressionally conferred power of eminent domain.

The other alternative is the continued, but strengthened, use of the present combination of subregional organization and intergovernmental contractual arrangements. In identifying this as an alternative possibility, it is recommended that this approach be employed in combination with the Regional Council proposed in this report. In other words, the continued--and hopefully strengthened--use of subregional organization and intergovernmental contractual arrangements for water supply and waste management would be subject to some degree of supervision by the Regional Council.

C. THE REGIONAL COUNCIL

The Regional Council, as envisioned herein, would be patterned in part after the Minneapolis-St. Paul Metropolitan Council. Created by an interstate compact among the District of Columbia, Maryland and Virginia, and approved by the Congress, the Regional Council would serve as the primary vehicle in the National Capital Region for areawide planning. As such, it would be authorized and directed to prepare and adopt, after public hearings, a comprehensive development guide for the National Capital Region. Following adoption, the guide would become the official plan for the entire region.

In effect, therefore, this part of the Regional Council's program would continue the regionwide planning function now performed by the Metropolitan Washington Council of Governments, and the latter would go out of existence after phasing its operations and resources into those of the Regional Council. Four important features would especially distinguish the new Regional Council from the present Council of Governments: (1) the Regional Council's statutory foundation in an interstate compact; (2) under the favored methods for organizing the Council, its responsiveness and accountability to the people of the Region through popular election of the members directly to the Council; (3) the requirement that the Regional Council must hold public hearings before adopting the comprehensive development guide for the National Capital Region which it would be expected to prepare and adopt; and (4) its ability, through the adoption of the comprehensive development guide, to serve as the vehicle for binding regional policy decisions.

As detailed below, these policy decisions would be controlling over water supply and waste management programs throughout the Region. The Council's development guide thus would be the vehicle through which the impact of water supply and waste management decisions on the environment would be fully explored and through which any adverse effect on the environment could be minimized. It also would be the means for assuring that the Region's areawide water supply and waste management plans and policy decisions would respond as fully as possible to other goals of the Region as expressed in development guides for land use, economic development, and other service or resource management areas prepared for the entire Region by the Council and for each constituent jurisdiction by its own functional or comprehensive planning agency.

Insofar as the Council's regionwide development guide would affect other service or resource management programs, it would be advisory to the various governments in the National Capital Region. The authority of the Council to make policy decisions which would be controlling could be extended, of course, to other service or resource management programs. Such extension could be accomplished either at the time the compact would go into effect or later, if subsequently approved by the compacting parties.

Organization of the Regional Council

As stated above, the Environmental Protection Agency expects that the State and/or local drafters of the compact establishing the Regional Council would determine the exact details of its organization and structure. Although offering various suggestions below, the Environmental Protection Agency stresses its view that these details should be determined by the State and local governments most immediately responsible for the governing of the National Capital Region.

This conclusion applies, first, to the definition of the geographic scope of the Region. It is suggested, however, that the drafters of the compact consider defining the National Capital Region, for purposes of water supply and waste management, as the area within the Washington Standard Metropolitan Statistical Area plus Charles County, Maryland. Inclusion of the latter is suggested because it is the proposed site of a wastewater treatment plant which would serve portions of both Charles County and Prince George's County. Projections also point to a rapid increase in the population of Charles County during the next 20-30 years.

Alternative Methods of Determining and Selecting the Council's Membership

The conclusion that the Council's organizational details should be determined by the compact's drafters applies also to the membership of the Council. It is suggested, however, that the Council's members represent either the existing local jurisdictions--i.e., cities, including the District of Columbia, and counties in the Region--or new local election districts specifically created for this purpose. This suggestion is based on the fact that both the Regional Council and its agent, the Environmental Services Corporation, would be rendering functions traditionally associated in this country with local, rather than State, governments.

Individual members of the Regional Council could be selected either by direct election to the Council by the voters of the Region or by appointment from the local governments included as the constituent elements of the Council. Under the first option--direct election--additional options might be election at large from the entire Region or election from the jurisdictional units (either already in existence or especially created) comprising the Council. Under the other major option--appointment from a local government--either the Council of Governments approach, i.e., limiting appointment to an elected local official, or a less restrictive approach would be possible.

Various alternatives also would be available to the compact drafting committee with regard to voting arrangements. Thus the vote of each individual member on the Council could be governed by the one man, one vote principle, or it could be based on the legal equality of each of the constituent jurisdictions. Similarly in the casting of votes, the compact could require that the Council's decisions be based on a simple majority, an extraordinary majority, unanimity, or some combination of these, depending upon the nature of the question.

Three Suggested Alternatives

The three alternatives which are described below are in the order favored by the Environmental Protection Agency. (Again it is emphasized that they are not intended to preclude consideration or adoption of some other alternative by the compact drafting committee.) The first two alternatives embody three important principles: (1) the limiting of membership of local governments proposed as members of the Regional Council to those which meet the criteria of, first, a general purpose governmental role and second, independence from other general purpose units at the city or county level; (2) election of members directly to the Council rather than to some office in a constituent unit; and (3) application of the one man, one vote principle.

The third alternative below does not include the second of these principles, but it is included as a possible means of organizing the Council because it would continue the type of representation employed in the present Council of Governments. It thus is familiar to the people and local governments of the Region.

If the first of the above principles and the earlier suggestion pertaining to Charles County were to be applied, the constituent governmental jurisdictions in the Regional Council initially would include the District of Columbia and the following jurisdictions in Maryland and Virginia:

Maryland	Virginia
Charles County	Arlington County
Montgomery County	Fairfax County
Prince George's County	Loudoun County
	Prince William County
	City of Alexandria
	City of Fairfax
	City of Falls Church

Under the first alternative for organizing the Regional Council, it would be composed of a single member from each of the above jurisdictions. Under this approach, therefore, the Council initially would have a total membership of eleven. Under this arrangement, the members would be selected through direct election by the voters in each of the eleven constituent units. Utilizing a system of weighted voting, the voting power of each of the constituent jurisdictions would be based on its population. Table 6, which follows, presents the initial distribution of votes among the eleven members, with votes weighted to reflect the 1970 distribution of population within the National Capital Region.

TABLE 6

DISTRIBUTION OF VOTING POWER
ALTERNATIVES ONE AND THREE

	Number of Members	Percent of Region's Total 1970 Population	Voting Power
Arlington County	1	6.0	6
Fairfax County	1	15.6	16
Loudoun County	1	1.3	1
Prince William County	1	3.8	4
City of Alexandria	1	3.8	4
City of Fairfax	1	0.8	1
City of Falls Church	1	0.4	*
District of Columbia	1	26.0	26
Charles County	1	1.6	2
Montgomery County	1	18.0	18
Prince George's County	1	22.7	23
TOTAL:	11	100%	101

* 1 vote shared with City of Fairfax

Under the second alternative, a majority of the Council would be selected through direct popular election from roughly equal population districts created specifically for this purpose. The balance of the Council would include one member selected by local elected officials in each of the eleven constituent jurisdictions. This representative would be required to be an elected legislative or executive official in the government which he would represent on the Council. Table 7 suggests how sixteen election districts might be created to implement this approach. Thus assuming sixteen members directly elected by the people in these districts, and assuming eleven members representing the governments of the eleven major constituent jurisdictions, the Council would have a total membership of twenty-seven. Under this approach, each of the twenty-seven members would cast a single vote.

The third alternative resembles the first except in the method of selecting the eleven members of the Council. Under this alternative, the governing body in each of the constituent units would appoint a locally-elected legislative or executive official as its representative on the Council. As under the first alternative, each member's vote would be weighted according to population, and Table 6, accordingly, also depicts the distribution of voting power under this approach to the Council's organization.

For directly elected members under the first two alternatives, the compact establishing the Council would spell out details concerning term of office, compensation, etc. For members not elected directly to the Council, each government represented in the Council would be free to determine which elected official would serve as its representative, the manner of his selection, his term of office, etc.

None of the alternatives, of course, suggests what type of majority should be required for a Council decision. This too is a matter which should be determined by the drafters of the compact after carefully balancing of the need to protect the minority with the need to avoid irrevocable veto by a minority of the majority's wishes and the ability to act effectively.

Non-Voting Members

Under each of these approaches, three nonvoting members would be appointed by the President, the Governor of Maryland and the Governor of Virginia to represent the Federal Government and the two States, respectively. In the event of a tie vote, the compact might provide that these three members would cast the tie-breaking votes.

TABLE 7

SUGGESTED ELECTION DISTRICTS IN ALTERNATIVE TWO

Jurisdiction	1970 Population of Each Election District	Number of Election Districts
District of Columbia	189,127	1
	189,128	1
	189,127	1
	189,128	1
Total	756,510	4
Maryland		
Montogomery County	174,269	1
	174,270	1
	174,270	1
	522,809	
Prince George's County	177,061	1
	177,061	1
	177,061	1
Prince George's County	129,384	
Charles County	47,678	
	177,062	1
Total	1,231,054	7
Virginia		
Arlington County	174,284	
Falls Church City	10,772	
	185,056	1
Loudoun County	37,150	
Fairfax County	146,850	
	184,000	1
Fairfax County	184,000	1
Fairfax County	51,092	
Fairfax City	21,970	
Alexandria City	110,938	
	184,000	1
Fairfax County	79,079	
Prince William County	111,102	
	184,181	1
Total	921,237	5
GRAND TOTAL	2,908,801	16

Functions, Authority and Responsibilities

Nature of the Council's Development Guide

The development guide to be prepared and adopted by the Regional Council would consist of policy statements, goals, standards, programs, and maps prescribing plans for the orderly and economic development, public and private, of the National Capital Region. The compact would identify the service and resource management areas which would become components or elements of the development guide. In addition to water supply and waste management, it would be desirable that these elements include land use; recreation, scenic values and open space; transportation; and any other service or resource management areas in which future developments will impact the entire metropolitan area or more than a single community.

Supervisory Relationship to Water Supply and Waste Management

In developing its comprehensive development guide for the National Capital Region, the Regional Council would be directed by the compact to give first priority to the preparation of integrated areawide plans for water supply; the collection, treatment, and disposal of liquid wastes; and the disposal of solid wastes. In addition, it is assumed that the Council would serve as the vehicle designated by the Governors pursuant to the Clean Air Act for preparing recommended plans for the National Capital Region for implementing national primary and secondary ambient air quality standards.

The compact would also direct that, upon completion and adoption by the Regional Council of the development guide, each local government in the Region or any governmental body performing retail water supply and/or waste management functions would prepare, for the area it serves, functional plans consistent with the Council's regional development guide.

The Regional Council would also establish and oversee the operations of the Environmental Services Corporation. It would do so through the exercise of the following supervisory powers:

- Appointment of the members of the governing board of the Corporation. The Council also would appoint one of the members of the board as its chairman.

- Directing that the Corporation prepare water supply and waste management plans consistent with the Council's regional development guide.

- Review and approval of the Corporation's plan for wholesale facilities for providing water supplies and waste management in the National Capital Region.

- Suspension of any portion of the Corporation's plan which the Council finds is inconsistent with its comprehensive development guide for the Region.

- Review and approval of the service areas established by the Corporation.

- Review and approval of an annual budget for the Corporation which would show proposed expenditures and revenue sources, including allocation of costs to the jurisdictions served for (1) operation, administration, and maintenance of the Corporation's facilities, (2) acquisition, construction, or improvement of such facilities and (3) debt service and repayment.

- Authorization of bonds, certificates of indebtedness, and other contractual arrangements for the purpose of acquiring or constructing the Corporation's water supply and waste management facilities.

In water supply and waste management, the Regional Council also would be authorized to exercise the following authority with respect to municipalities, including the District of Columbia, the counties, and independent commissions, boards and agencies in the National Capital Region:

- Require that each such entity providing water supply and/or waste management services of a retail nature submit its plans covering new facilities for this purpose to the Corporation for review, comment and recommendation.

- Based upon the Corporation's advice, require modification of any features of such plans which the Council finds substantially inconsistent with its development guide and the Corporation's plan.

It is recommended that the compact drafting committee formulate procedures permitting a local community or entity to appeal the Council's decisions in the matters described above and providing for the resolution of differences which might arise.

Other Relations With Local Governmental Bodies

The Regional Council would be authorized to exercise the following authority with respect to municipalities, including the District of Columbia, the counties, and independent commissions, boards and agencies in the National Capital Region:

- To review and make recommendations concerning their long-term comprehensive plans or any other matter having a substantial effect on the development of the National Capital Region.

- To delay action on such plans for a period up to 60 days.

- To circulate such plans to other affected jurisdictions and, if there is substantial interest, to hold a public hearing.

- To attempt through its recommendations to mediate and resolve differences of opinion with respect to such plans and matters.

The Council also would have the authority to appoint a nonvoting member to any special multijurisdiction commission or board established by law and operating within the National Capital Region. It could assume, initially if authorized by the compact or subsequently if approved later by the governments establishing the Council, oversight authority over such agencies comparable to that it would exercise over the Environmental Services Corporation.

Regional Development Fund

The Council would be authorized to establish and administer a Regional Development Fund. The Fund could be used for loans to finance the construction of retail facilities for water supply and waste management by local governmental units or bodies in the region. It also could be used to finance other projects--such as development of open space and recreation area, scenic improvements, and acquisition of land to control land use and urban development--having the purpose of protecting or enhancing the quality of the physical environment in the National Capital Region. All projects assisted by the Fund would be required to conform to the Council's development guide and, in the case of projects not for water supply or waste management, would be required to serve a regional or multicommunity purpose as determined by the Council.

Authority in Relation to Federal Programs

The Regional Council would serve as the clearinghouse and review agency for a grant or loan from the Federal Government under procedures developed pursuant to Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966 and Title IV of the Intergovernmental Cooperation Act of 1968. Under the same procedure, the Council also would review Federal public works plans and proposals which would affect the National Capital Region, and Federal agencies would be expected to consult with the Council in preparing such plans and proposals and to submit them to the Council for its review and comments. The Council's review role with regard to Federal public works would not, however, preempt any Federal agency's planning and review function for the National Capital Region, such as that presently carried on by the National Capital Planning Commission.

Relationship to Basin Agencies

Plans and policy decisions for the National Capital Region developed and adopted by the Regional Council would be expected to conform to policies and requirements applicable to the Region established by the Interstate Commission on the Potomac River Basin or its successor agency. A representative appointed by the basin agency would serve on the Council without vote for liaison purposes. The Council would be responsible for presenting to the basin agency the areawide interests of the National Capital Region in the management of the water and related natural resources of the basin.

Use of Technical Advisory Committees

The Regional Council would have authority to establish and utilize technical advisory committees composed of representatives of the government of the District of Columbia and the Maryland and Virginia suburban jurisdictions.

Data Collection, Research and Study of Regional Problems

The Regional Council would be authorized to undertake activities of this nature. It also could provide planning services to any local government within the region on a reimbursable basis.

Chairman and Administrative Staff

The Regional Council would elect the chairman from its own membership. An executive director appointed by the Council and serving at its pleasure would be the principal executive officer.

Financing the Regional Council

Based on the operating experience of the Minneapolis-St. Paul Metropolitan Council and the MWCOG, an estimated \$3.5 million annually would be required initially to fund the Regional Council's planning and oversight functions. This financing would be obtained from (1) direct contributions to the Council by its constituent jurisdictions and (2) grants-in-aid currently available from the States and/or the Federal Government.

The basis for contributions from the member jurisdictions should be spelled out in detail in the compact establishing the Council. Bases for determing the amount of each jurisdiction's contribution which could be considered include, but are not necessarily limited to, one or a combination of the following: (1) a contribution based on the value of taxable property or the incremental increases in such values; (2) a contribution based on the jurisdiction's total population; and/or (3) a contribution based on the average per capita income. Each jurisdiction would be obligated by the compact to provide the requested funds but would be free to raise such funds in the manner it sees fit.

D. THE ENVIRONMENTAL SERVICES CORPORATION

The Environmental Services Corporation would be the vehicle for effecting consolidation of the acquisition, construction and operation of the Region's water supply and waste management facilities of a wholesale nature. It would sell its services in these fields throughout the Region through marketing arrangements for this purpose with the District of Columbia and the suburban jurisdictions and entities. The District and the latter thus would continue to retail all of these services directly to the people of the Region.

The Corporation thus would be the vehicle for correcting the separation of water supply and waste management programs and the fragmentation of programs in these areas which are a major present institutional weakness in the Region. Through it, the Region also would be able to achieve important economies of scale in water supply and waste management operations not available under the present fragmented approach to the provision of these services. Also, as a government corporation, it would have various attributes which would be an advantage in the provision of these utility-type services. These include (1) a legal personality separate and distinct from the governments of the Region which would enable the Corporation to sue and be sued, enter into contracts and acquire property in its own name; (2) independent financing from revenues and borrowing rather than from annual appropriations by legislative bodies; (3) freedom from many of the restrictive statutes applicable to government supply activities and from general budget, accounting and audit laws and regulations; and (4) greater flexibility in its determination and administration of personnel policies.

It is recommended that the Corporation be established as an intergovernmental agency at the level of local government in the National Capital Region. Accordingly, the interstate compact establishing the Regional Council would also authorize that body to establish the Corporation as its agent to effect this consolidation. The compact itself would provide details governing the specific powers and responsibilities of the Corporation, the nature of its governing board, the relationships with the governments and others it would serve, and other aspects of the Corporation's structure and operation. In general, it is recommended that the compact in this respect adhere closely to the statutory provisions in Minnesota establishing the Metropolitan Sewer Service Board as an agency of the Minneapolis-St. Paul Metropolitan Council.

The Regional Water Supply and Waste Management System

The Environmental Services Corporation would be directed to prepare a functional plan for a regional system of water supply and waste management facilities of a wholesale nature in the National Capital Region which is consistent with the Regional Council's development guide for the Region. The plan would identify facilities now in existence in the Region which the Corporation, with the Council's approval, would propose to take over and thereafter operate as a regional facility. The plan also would identify needed new regional facilities which the Corporation, again with the Council's approval, would propose to construct and operate.

Implicit in the above is the intent that the Corporation would have the right to acquire any properties and facilities presently owned and operated by any local municipal government, commission, authority or agency, or private owner, which would be useful for its purposes.

The Corporation also would be authorized to exercise the usual powers of a municipal corporation, such as the right of eminent domain, the power to sue and be sued, use of public right-of-way, etc. This should be clearly defined in the interstate compact authorizing creation of the Corporation.

Tentative recommendations by the Environmental Protection Agency in the following section indicate the existing water supply sources intake and treatment facilities, the wastewater interceptor sewers and treatment plants, and the solid waste disposal facilities which might be included in the regional system outlined in the Corporation's plan. The Environmental Protection Agency stresses the tentative nature of these recommendations, because it firmly believes the people of the Region, as represented in the Regional Council, should determine the exact composition of this regional system.

Facilities Recommended for Inclusion in the Corporation's Regional System

As stated in Chapter III, tentative selection of existing plants, pump stations, pipelines, incinerators, and other facilities, which appear to be amenable to regional operation, was accomplished in consultation with staffs of the present owners. Systems maps were studied and cost data determined from owner records. Capital expenditures expected through year 1980 are those projected by the present owner.

Water Supply Facilities

The composition of the tentative regional system is shown on Fig.11.

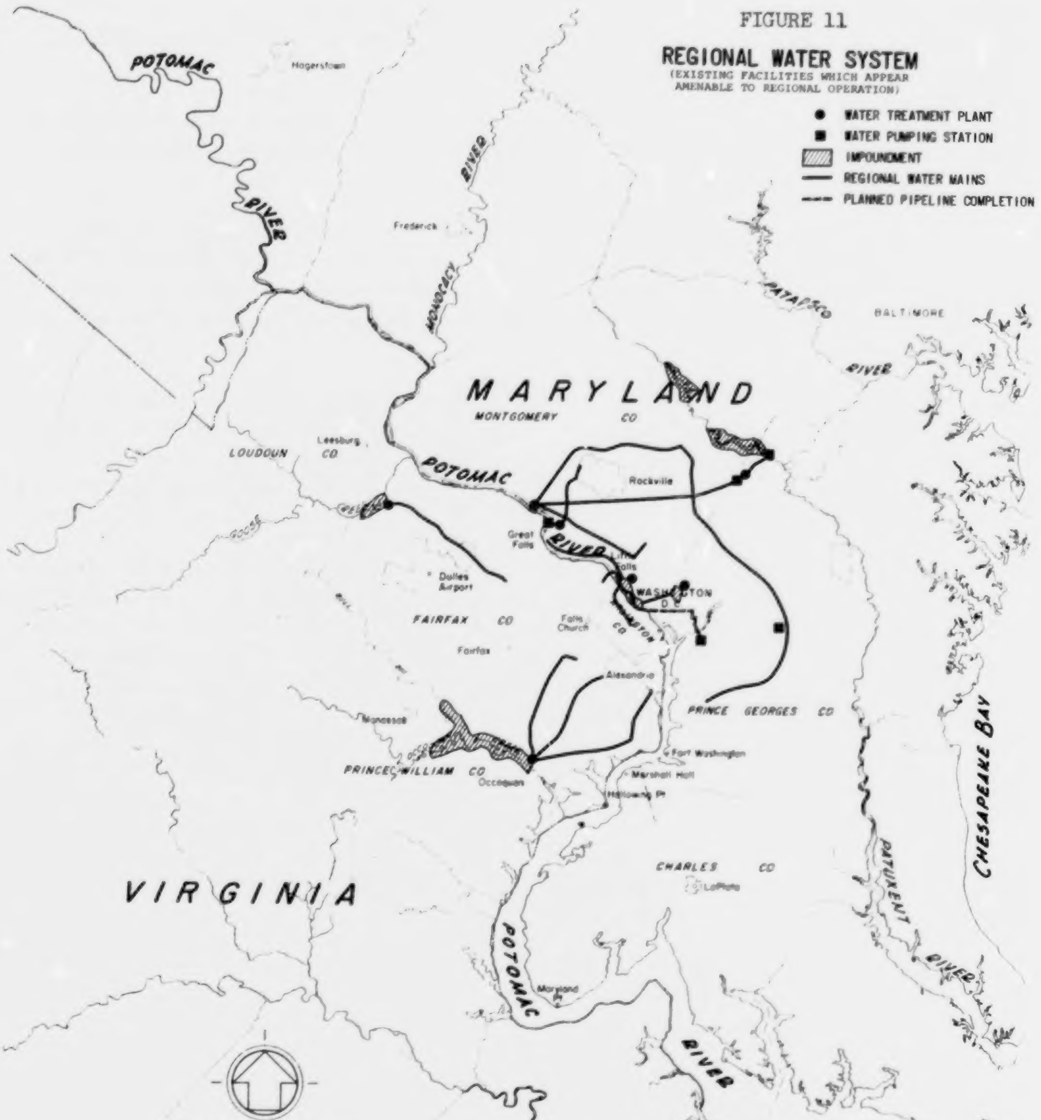


FIGURE 11

REGIONAL WATER SYSTEM
(EXISTING FACILITIES WHICH APPEAR AMENABLE TO REGIONAL OPERATION)

● WATER TREATMENT PLANT
■ WATER PUMPING STATION
▨ IMPOUNDMENT
— REGIONAL WATER MAINS
--- PLANNED PIPELINE COMPLETION
POTOMAC
RIVER
Hagerstown
MONOCACY
RIVER
Frederick
PATAPSCO
RIVER
BALTIMORE
MARYLAND
MONTGOMERY CO
LOUDOUN CO
Leesburg
POTOMAC
Rockville
Great Falls
RIVER
Dulles Airport
WASHINGTON
D C
FAIRFAX CO
Falls Church
Fairfax
Alexandria
Manassas
PRINCE WILLIAM CO
Occoquan
PRINCE GEORGES CO
Fort Washington
Marshall Hall
CHARLES CO
La Plata
VIRGINIA
POTOMAC
RIVER
PATUXENT RIVER
CHESAPEAKE BAY
MILES

Sources of impounded raw water are included with the plants making withdrawals therefrom. Systems included are those which are, or can be, multijurisdictional in area served. Pipelines included are generally those of 30-inch or greater size which perform a regional function, and which are not so intimately integral to distribution functions or multi-pressure zones, as to preclude successful operation by a regional entity. The 24-inch trunk main of the Fairfax City system has been included as a regional facility due to its multijurisdictional service nature, the likelihood of its being reinforced or paralleled at a later date, and the potential for large scale development of the source on Goose Creek. Pumping stations included are those integral to the bulk transport of water. A quick perusal of the existing facilities depicted on Fig. 11, reveals the obvious advantage of provision of additional trunk mains (e.g., tentatively along the westerly route of the Capitol Beltway) to interconnect the separate systems into one large, interconnected regional system. Subregional interconnections of large capacity are also desirable, as discussed previously.

It should be recognized that the water treatment plants of the Washington Aqueduct, the city of Rockville, and the Potomac plant of Washington Suburban Sanitary Commission are dependent solely on the main stem of the Potomac River as a source of raw water supply. All three operating agencies are, and will be, competing for the available limited flows during periods of drought. It would appear advisable to include all three plants in the initial regional system to avoid possible litigation between the competing agencies, and other consequences lying beyond the scope of the existing "Plan of Action for Conservation of Water Use During Periods of Low Flows in the Potomac River, June 1969."

The Potomac Estuary pumpage facility, located at the East end of Chain Bridge, is designed to deliver water from the Estuary to the Dalecarlia water treatment plant during periods of low flow in the main stem, and has been included as a regional facility. The regional function is assignable due to the critical short-term water supply need fulfilled by the facility and the importance of coordination of effective liquid waste treatment to the maintenance of high water quality of this source in the Estuary.

Wastewater Facilities

The composition of the tentative regional sewerage system is shown on Fig. 12. Systems included are those which are, or can be, multijurisdictional in area served. Pipelines included are generally those of 30-inch or greater size which specifically perform a regional function of bulk transport of liquid wastes. Pumping stations included are those which are integral to the bulk transport function of the pipelines they serve. The proposed Charles County Sanitary District, Inc., plant and system on Mattawoman Creek is included due to its service area overlap into Prince Georges County, and the effect of its treated effluent

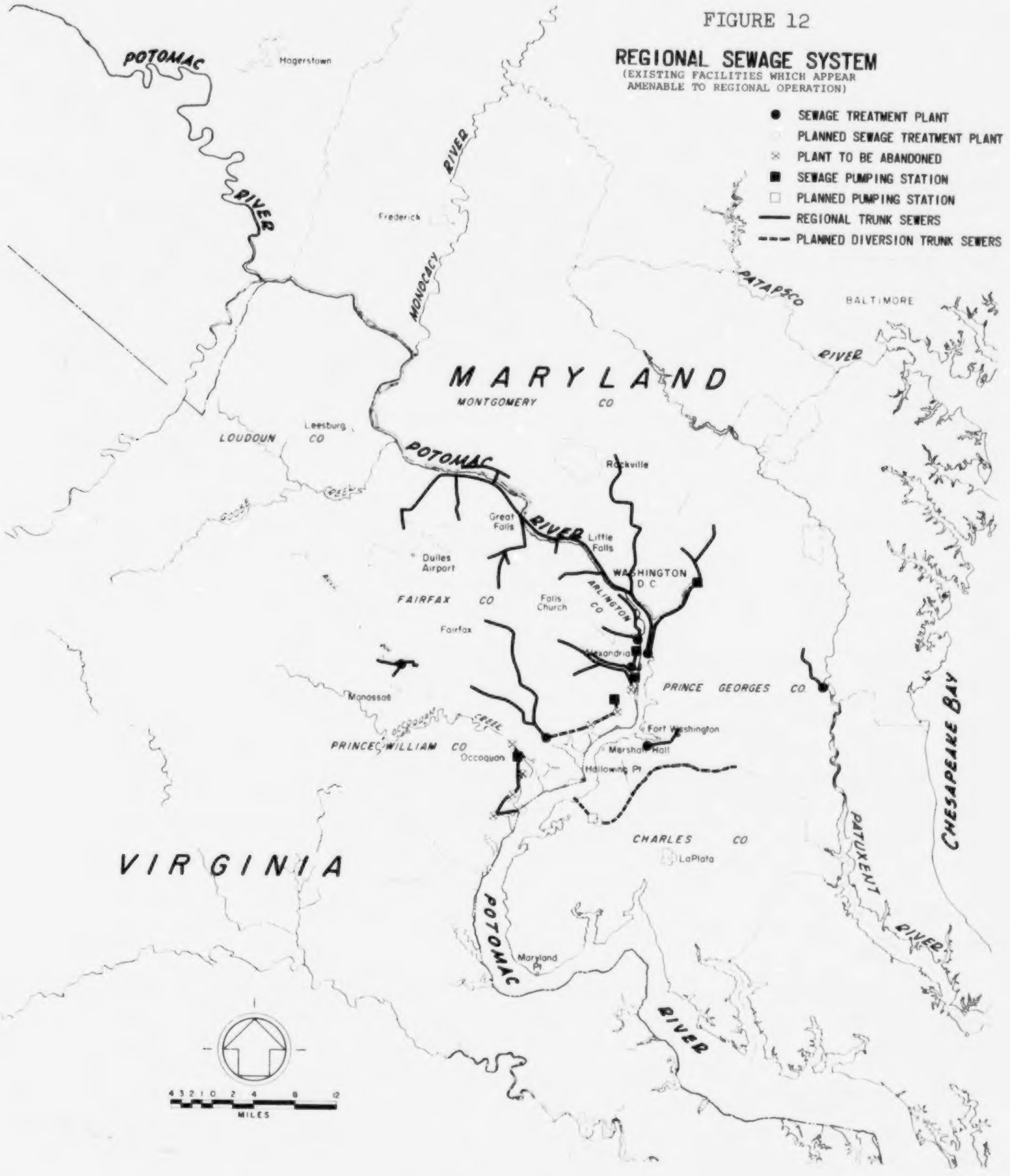


FIGURE 12

REGIONAL SEWAGE SYSTEM
(EXISTING FACILITIES WHICH APPEAR AMENABLE TO REGIONAL OPERATION)

● SEWAGE TREATMENT PLANT
○ PLANNED SEWAGE TREATMENT PLANT
× PLANT TO BE ABANDONED
■ SEWAGE PUMPING STATION
□ PLANNED PUMPING STATION
— REGIONAL TRUNK SEWERS
- - - PLANNED DIVERSION TRUNK SEWERS
POTOMAC
RIVER
Hagerstown
MONOCACY
RIVER
Frederick
PATAPSCO
RIVER
BALTIMORE
MARYLAND
MONTGOMERY CO
LOUDOUN CO
Leesburg
Rockville
Great Falls
Little Falls
Dulles Airport
WASHINGTON D.C.
ARLINGTON CO
FAIRFAX CO
Falls Church
Fairfax
Alexandria
Manassas
PRINCE GEORGES CO.
OCCOQUAN CREEK
Fort Washington
Marshall Hall
PRINCE WILLIAM CO
Occoquan
Hallowing Pt
CHARLES CO
LaPlata
VIRGINIA
Maryland Pt
PATUXENT RIVER
CHESAPEAKE BAY
4 3 2 1 0 2 4 8 12
MILES

on the Potomac main stem. The Greater Manassas Sanitary District plant and system is included due to present planning underway to expand and upgrade the facility into a possible "Upper Occoquan Sewage Authority" regional facility, and the impact of its treated effluent on the major Occoquan watershed. It is conceived that regional liquid waste treatment facilities can be constructed and operated on tributaries, in addition to those on the Potomac main stem, provided that a high degree of treatment and adequate fail-safe features are incorporated therein.

Solid Waste Disposal Facilities

The facilities included in the tentative regional solid waste disposal system are shown on Fig. 13, as either processing-transfer stations, incinerators or sanitary landfills. The basic concept is that the regional solid waste disposal system should include most processing-transfer stations and incinerators (those that process waste but do not provide disposal), and the landfills which they serve. It would not include small landfills in less populated areas which are designed to serve only limited areas. Jurisdictions which have built, or are planning, processing facilities have usually acknowledged that they are now or will be unable to continue to dispose of solid wastes within their boundaries. It is these jurisdictions which can benefit most from a regional agency. An adequate plan now exists in Prince Georges County, insuring self-sufficiency until nearly the year 2000. The incinerator that the County plans to construct is intended to use landfills within the County which have already been acquired. A regional disposal agency could reevaluate the incinerator design and capacity and may choose to enlarge it or to replace it with a rail-haul system. This could be done without penalizing the County through accelerated depletion of the landfill space now reserved.

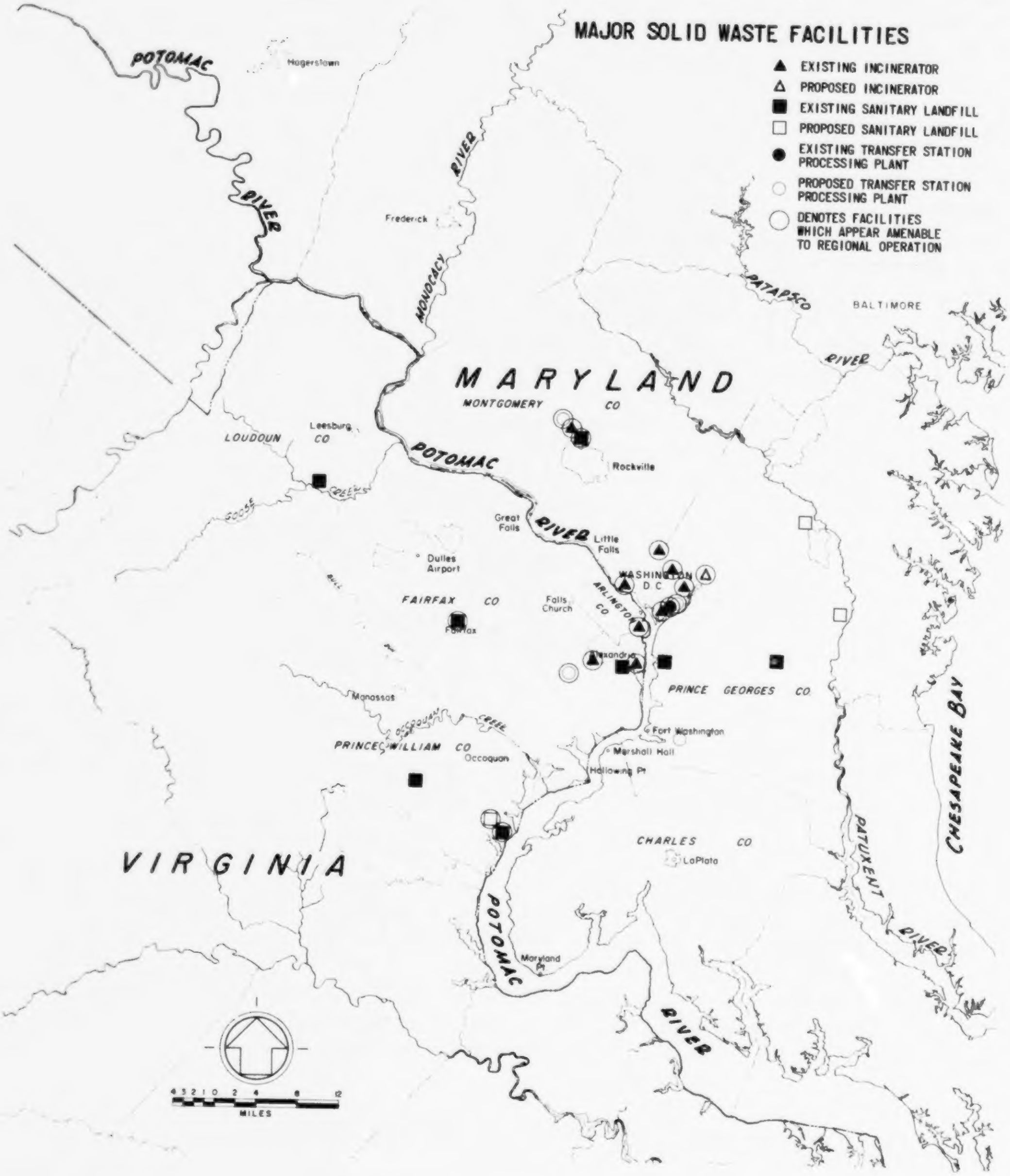
The regional solid waste disposal agency would rely initially on ultimate disposal in existing sanitary landfills. Future landfill sites would be located in areas delineated by regional land use plans adopted by the Regional Council or in areas outside the Region.

Regional disposal facilities currently being planned by the Council of Governments, through its Waste Management Agency, would be the first new facilities provided by the proposed new Environmental Services Corporation. The transfer system is expected to cost $9.9 million, which would allow the deactivation of three incinerators in Arlington and Alexandria. It is tentatively projected that operation of the MWCOG plan system will be less expensive than the continued improvement and operation of individual incinerators.

Estimated Cost of Acquiring and Constructing the Regional System

Table 8 presents detailed data utilized in developing this study's

FIGURE 13



MAJOR SOLID WASTE FACILITIES

▲ EXISTING INCINERATOR
△ PROPOSED INCINERATOR
■ EXISTING SANITARY LANDFILL
□ PROPOSED SANITARY LANDFILL
● EXISTING TRANSFER STATION PROCESSING PLANT
○ PROPOSED TRANSFER STATION PROCESSING PLANT
◯ DENOTES FACILITIES WHICH APPEAR AMENABLE TO REGIONAL OPERATION
POTOMAC
Hagerstown
RIVER
MONOCACY
RIVER
Frederick
PATAPSCO
RIVER
BALTIMORE
MARYLAND
MONTGOMERY CO
Rockville
Leesburg
LOUDOUN CO
POTOMAC
GOOSE CREEK
Great Falls
RIVER
Little Falls
Dulles Airport
WASHINGTON D.C.
FAIRFAX CO
Falls Church
ARLINGTON CO
Fairfax
Alexandria
PRINCE GEORGES CO
Manassas
OCCOQUAN CREEK
PRINCE WILLIAM CO
Occoquan
Fort Washington
Marshall Hall
Hallowing Pt
CHARLES CO
LaPlata
VIRGINIA
POTOMAC
Maryland Pt
RIVER
PATUXENT RIVER
CHESAPEAKE BAY
4 3 2 1 0 2 4 8 12
MILES

TABLE 8

COST DATA FOR REGIONAL SYSTEMS a/

	Cost of Existing Facilities b/	1970 Bonded Indebtedness	1970 Debt Service	1970 Annual O & M Costs Existing Facilities	1971 - 1980 Ten Year Capital Improvements Costs c/	1980 d/ Debt Service	1980 O & M Costs
WATER SUPPLY				(IN MILLIONS OF DOLLARS)			
District and Aqueduct							
Treatment	38.600	n.a.	n.a.	4.320	19.000	1.235	9.500
Transmission	8.730	5.330	.346	.210	22.100	1.783	.520
Total	47.330	5.330e/	.346e/	4.530	41.100	3.018e/	10.020
Virginia							
Treatment	25.000	21.950	1.285	.927	13.000	2.130	1.988
Transmission	24.654	13.642	.830	.707	11.850	1.600	.957
Total	49.654	35.592	2.115	1.634	24.850	3.730	2.945
Maryland							
Treatment	36.950	30.168	1.870	2.345	34.800	4.132	4.424
Transmission	32.960	28.253	1.630	.110	39.100	4.172	.616
Total	69.910	58.421	3.500	2.455	73.900	8.304	5.040
Total Water Network							
Treatment	100.550	52.118	3.155	7.592	66.800	7.497	15.912
Transmission	66.344	47.225	2.806	1.027	73.050	7.555	2.093
Total	166.894	99.343e/	5.961e/	8.619	139.850	15.052e/	18.005
SEWERAGE SYSTEMS							
District							
Treatment	26.500	4.000	.300	4.500	359.300	6.139	21.100
Interception	57.600	23.700	1.500	.700	9.300	1.651	1.125
Total	84.100	27.700	1.800	5.200	368.600	7.790f/	22.225
Virginia							
Treatment	24.264	13.893	.975	2.333	75.190	2.197	10.615
Interception	37.377	21.412	1.355	.513	21.761	1.709	2.262
Total	61.641	35.305	2.330	2.846	96.951	3.906f/	12.877
Maryland							
Treatment	13.540	12.177	.730	.461	140.300	3.010	10.600
Interception	12.520	7.110	.430	.080	50.500	1.251	.600
Total	26.060	19.287	1.160	.541	190.800	4.261f/	11.200
Total Sewerage Network							
Treatment	64.304	30.070	2.005	7.294	574.790	11.346	42.315
Interception	107.497	52.222	3.285	1.293	81.561	4.611	3.987
Total	171.801	82.292	5.290	8.587	656.351	15.957f/	46.302
SOLID WASTE							
District	24.595	18.900	1.500	4.560	9.350	2.110	3.800
Virginia	5.442	2.190	.157	1.407	9.900	.800	1.650
Maryland	7.023	6.300	.400	.742	37.500	2.840	5.250
Total Solid Waste	37.060	27.390	2.057	6.709	56.750	5.750	10.700
COST SUMMARY							
Water Supply	166.894	99.343	5.961	8.619	139.850	15.052	18.005
Sewerage Systems	171.801	82.292	5.290	8.587	656.351	15.957	46.302
Solid Waste	37.060	27.390	2.057	6.709	56.750	5.750	10.700
Grand Total	375.755	209.025	13.308	23.915	852.951	36.759	75.007

a/ Present and proposed facilities may, in fact, serve more than one jurisdiction. These cost figures do not attempt to identify the pro-rata cost burdens, but identify total costs administered by the identified jurisdiction.

b/ Cost of existing facilities are those at time of construction.

c/ Projects are those planned by present owner. Costs are total project cost as estimated by owner before grant credits are applied.

d/ The debt service charges for 1980 include both the costs of servicing the bonds issued for capital improvement programs during the 1971-1980 interval as well as the residual of 1970 debt service. Costs are based on assumed 30-year serial bonds with a net interest rate of 5%.

e/ These figures do not include an allowance for the 1970 outstanding debt of the Washington Aqueduct. Said information was not available at the time of the compilation of the above data.

f/ These figures are based upon the level of indebtedness which would prevail after State and Federal grants are deducted from the capital improvement costs, and are based on an assumed 25% local share.

estimate of the cost to the Regional Council and the Environmental Services Corporation of acquiring, constructing and operating a regional system of wholesale facilities for water supply and waste management. Explanatory footnotes of the table also explain various assumptions and other decisions made in arriving at the cost estimate. A summary of these costs are:

	Cost of Existing Facilities	Bonded Indebtedness (in millions of dollars)	Cost of New Construction 1971-80
Water supply	$166.894	$99.343	$139.850
Wastewater collection and treatment	$171.801	$82.292	$656.351
Solid waste disposal	$ 37.060	$27.390	$ 56.750
New facilities and other costs not included in above*			$ 40.0
	$375.755	$209.025	$892.951

*These include certain facilities and studies needed for the successful initial operation of the regional system but not now planned by any agency. They are close-in, single-purpose reservoir (e.g., Goose Creek); a pumped storage reservoir sited to serve all Potomac River intakes and located off the main stream; site preservation of future single-reservoir sites; commitment to water supply allocations in proposed multipurpose reservoirs; a feasibility study to increase safe-yield of Tridelphia-Duckett reservoirs; and a study of the public health aspects of the use of the upper estuary as a long-term source of water supply.

Depending upon the exact terms of the Corporation's takeover of the existing facilities, the estimated cost of acquiring and constructing the regional system through 1980 ranges from $1.1 billion to $1.27 billion. The lower estimate includes $209 million for the assumption or payment of the outstanding debt of existing facilities and $893 million for new construction. The higher amount also includes the latter figure but assumes that acquisition of existing facilities would involve more than only the corporation's assumption or payment of the outstanding debt. In the event existing facilities were to be acquired on the basis of their present worth, the total cost would exceed even the $1.27 billion estimate.

The local share of the above 1971-80 new construction costs will be reduced by any applicable grants. It is not predictable at this time to what degree the large scale water supply and solid waste disposal facilities may qualify for grant funds. It is assumed, however, that the Corporation would apply for the maximum eligible construction grants for its wastewater facilities from both Federal and State programs and that all will so qualify. It is assumed that 5% of sewerage project costs are ineligible so that local share will be a minimum of 25% of each project total.

On the above basis the minimum Corporation share of 10-year construction costs for all three functions is projected by fiscal year requirements as follows:

Fiscal Year	Minimum Local Costs by year	Cumulative Local Costs	Cumulative Percent
1971	27.914	27.914	8.1
1972	56.959	84.873	24.8
1973	65.987	150.860	44.0
1974	73.569	224.429	65.5
1975	43.932	268.361	78.3
1976	26.386	294.747	86.0
1977	19.475	314.222	91.7
1978	14.175	328.397	95.8
1979	10.575	338.972	98.9
1980	3.750	342.722	100.0

It should be noted that some 80% of 10-year costs are projected to occur in the first five years.

Acquisition and Financing of the Regional System

To enable the Council and the Corporation to carry out the plan, the Federal Government would transfer to the Corporation the assets, personnel, and authority and responsibilities of the Washington Aqueduct and the wholesale water supply and waste management responsibilities and assets of the Department of Sanitary Engineering of the District of Columbia when requested by the Council and on condition that comparable other regional facilities are also transferred. Any facilities which the nonprofit Waste Management Agency of MWCOG might have constructed previously also would be transferred to the Corporation. With the approval of the Council, the Corporation also would acquire - through purchase, condemnation, or other arrangement - other existing facilities included in the regional system and would construct the new facilities identified in its plan.

As to facilities under construction or improvement by non-Federal jurisdictions at the time of acquisition, the Corporation would assume or pay the outstanding debt on the facility. For other facilities, the Corporation would assume or pay the outstanding debt and also grant credits based upon the value of the facilities, adjusted for such factors as Federal and State construction grants, the outstanding debt assumed by the Corporation, depreciation, and changes in price levels. Such credits would be used by the recipient to offset costs allocated to it for use of the Corporation's services.

Financing the Acquisition, Construction, and Operation of the Regional System

Over the long run, the financing of the acquisition, construction and operation of the regional system would rely primarily on a combination of revenues raised by the Corporation through the sale of its services to entities, public and private, providing retail services in water supply and waste management and through any available Federal and State grants. Also, the Regional Council could supplement funds raised in this manner through special contributions from its constituent local jurisdictions for capital improvement programs. Such contributions would be earmarked for acquisition or construction of the regional system and would be segregated from the Council's regular funds for its planning and oversight responsibilities.

Funds more immediately required by the Corporation to pay the outstanding debt or other contractual obligations incurred in its acquisition of existing facilities, and funds for financing the construction of additional new facilities, would be obtained through issuance of bonds, certificates of indebtedness or other fiscal arrangements authorized by the Regional Council. Financing methods authorized should be sufficiently flexible to ensure the most economical funding possible in the interest of the users.

In order for the Council and the Corporation to achieve this objective of least cost financial arrangements, the compact drafting committee should consider the following measures:

1. Authorization of limited taxing power to the Council or Corporation and/or the ability to pledge of faith and credit of the Council's constituent jurisdictions as backing for any bonds or certificates of indebtedness issued.

2. Authorization of contractual arrangements on the part of the Corporation allowing it to assume full fiscal liability for any outstanding bonded indebtedness on existing facilities acquired, and permitting the administration of payment of debt service to continue with the current owners of such facilities.

The compact would have to specifically authorize and make provision for limited taxing power, faith and credit backing and any such contractual arrangements for the Council and the Corporation if these measures are to be used. Also, the compact should stipulate the definitive conditions under which such measures, or any single one or combination thereof, could be utilized.

Federal Financial Assistance

The regular grant-in-aid programs and any other authorized financial assistance programs at the Federal level would be available sources of financial assistance to the Council and the Corporation in constructing new components of the regional system.

Allocation of the Costs of Acquiring, Constructing, and Operating the Regional System

The Environmental Services Corporation would be required annually to prepare and submit to the Regional Council for approval a budget showing estimated receipts of revenue and other funds and estimated expenditures for costs of (1) operation, administration, and maintenance of the regional system, including credits to each constituent jurisdiction; (2) acquisition and betterment of facilities in the regional system; and (3) debt service, including principal and interest.

The budget also would allocate current costs (defined as costs of operation, maintenance and debt service to be paid during the budget year, and costs of acquisition and improvement of the regional system to be paid during that year from funds other than borrowing) among the governments served by the Corporation. These current costs would be allocated generally on the basis of the use made of the Corporation's services, as modified by factors such as capacity reserved for future use, the benefits resulting to the entire metropolitan area from a particular system, and deferment of payments for capacity reserved but not yet used to prevent inequities in the allocation of current costs.

Protection of Employees Transferred to the Regional System

The establishment of the National Capital Environmental Services Corporation to provide wholesale water supply and waste management services will require the transfer of employees associated with the present operational facilities described above. In addition, the expected expansion and improvement of services in the near future will require additional personnel.

Estimates of the number of present employees which would be affected by the transfer of facilities are shown in the table below.

ESTIMATES OF TRANSFERRED EMPLOYEES

	Wastewater Treatment	Water Supply	Solid Waste Disposal	Total
Maryland	50	91	68	209
D. C.	298	290	334	922
Virginia	195	80	84	359
Total	543	461	486	1490

The above estimates are primarily personnel directly involved in the operation of facilities and do not include possible transfers of administrative support personnel that would be a necessary part of the Corporation.

As water supply and waste management facilities are expanded and improved to meet growing and more stringent requirements, the number of operating personnel must necessarily increase. For example, present plans call for the District of Columbia's Water Pollution Control Plant at Blue Plains to be expanded and to provide a very high level of treatment by the end of 1974. Operation of this advanced waste treatment facility will require an increase in the number of operating personnel from the present level of 288 to about 480.

Among the first tasks facing the proposed Corporation will be the development of a personnel system that will take into consideration the transfer of present employees. It will be necessary to protect the present interests of transferred employees with regard to salary compensation, retirement, leave plans, health and life insurance programs, and other fringe benefits. It will be necessary to provide for the complete protection of transferred employees so that they will not suffer any undue loss of benefits. Of the estimated 1490 employees now associated with the operational facilities considered amenable for regionalization, about 922 are employed under the Federal Government's Civil Service system by the District of Columbia and the Corps of Engineers. The various personnel in Virginia are employed under city, county, or similar plans which are generally uniform. Personnel in Maryland are under a variety of county, State, or independent plans.

Present salary scales are very similar and there should be no problem in developing a single scale which will be acceptable to all concerned. In a regionalization program, it can be anticipated that all employees will initially retain their present jobs at essentially the same salaries.

Any proposed common personnel system must deal with the problem of providing fringe benefits similar to those now enjoyed by personnel who may be subject to transfer. Because of the variety of personnel systems now utilized, this will be a difficult task. Of major concern will be the retirement programs, because of the past investment an employee may have in any given program. It may be necessary to establish a number of legal options available to a transferred employee, such as permitting him to remain with his present plan when possible, or allowing him to transfer invested retirement funds to the retirement program of the Corporation on a comparable basis.

E. TWO POSSIBLE ALTERNATIVES

Among possible alternatives to the recommended institutional arrangements, two merit special mention. One is a Federally-established corporation to take over facilities now under direct or indirect Federal control. The other is an alternative to both the proposed Environmental Services Corporation and the Federal corporation.

A Federally-Established Water Supply and Waste Management Corporation

Should the States and/or local governments within the National Capital Region choose not to establish the Regional Council and the Environmental Services Corporation, Congress may wish to establish a Federal corporation with the authority to (1) prepare an integrated water supply and waste management plan for the National Capital Region, (2) take over the wholesale water supply and waste management facilities and responsibilities of the Washington Aqueduct and the District of Columbia Department of Sanitary Engineering, and (3) take over and operate other wholesale water supply and waste management facilities in Maryland and Virginia either with the concurrence of the jurisdiction now owning the facility or through the exercise of a Congressionally-conferred power of eminent domain.

In that event, it is recommended that the Congress authorize and direct all Federal agencies providing Federal financial assistance for the construction of water supply and waste management facilities to make such grants within the National Capital Region only after the Federal corporation has certified that the project conforms to its plan for the Region. Legislation establishing the Federal corporation also should permit and invite the States and/or local governments in the Region to take over the Federal corporation subject to compliance with conditions specified by the Congress.

Continued, But Strengthened, Use of Subregionalization and Intergovernmental Contractual Arrangements

Under this alternative, the National Capital Region, in lieu of establishing either an interstate or a Federal corporation as the vehicle for consolidating water supply and waste management facilities of a wholesale nature in a single organization, would continue to rely primarily on subregional and intergovernmental contractual arrangements. This would build on arrangements that the governments in the National Capital area have used to achieve a substantial degree of cooperation and coordination in the area's water supply and waste management programs.

In identifying this as an alternative possibility, it is recommended that it be employed in combination with a Regional Council.

In other words, the continued--and hopefully strengthened--use of subregional organization and intergovernmental contractual arrangements for water supply and waste management would be subject to review by the Regional Council. At the minimum, the Council's authority in this regard should include the right of review and comment. Such authority should extend both to applications for Federal financial assistance and to any other plans or actions contemplated by agencies in the Region operating water supply and waste management facilities. More preferable would be the right of the Regional Council to disapprove and disallow any intergovernmental agreement which in its view is inconsistent with its development guide for the National Capital Region.

It is assumed, if this alternative were to be the choice of the State and local governments in the Region, that State and local governments in each of the major parts of the metropolitan area would move to strengthen subregional organization in these fields. More specifically, it would be desirable for northern Virginia, which now has twenty-five governmental units and two private firms providing water and/or sewer service, to establish a regional service district as authorized by the Virginia Area Development Act, or to create some other acceptable subregional organization.

In Maryland, subregionalization could be strengthened in a number of ways. Among these are the transfer of town and community water and sewerage systems in Charles County to the Charles County Sanitary Commission and better integration of that County's system with that of the Washington Suburban Sanitary Commission. Depending upon whether the WSSC or the Maryland Environmental Service were to be selected as the major vehicle for subregionalization in suburban Maryland, the chosen instrument also should be given responsibility for integrating water supply and wastewater management with the management and disposal of solid wastes.

Subregionalization in the District of Columbia and its ability to utilize intergovernmental contractual arrangements more effectively could be improved through strengthening the District's financial capabilities along the lines proposed by the President and by the transfer to the District of the water supply facilities and responsibilities of the Corps of Engineers.

F. ADVANTAGES IN THE RECOMMENDED APPROACH

The Environmental Protection Agency again recognizes and commends the substantial degree of regionalization of water supply and waste management which governments in the National Capital Region have achieved through voluntary and consensus planning, subregional organization, and intergovernmental contractual arrangements. It, however, reiterates its recommendation for a dual structure composed of the proposed Regional Council and Environmental Services Corporation. It believes that only through regional institutions along the lines of this dual structure can the Region effectively solve the weaknesses which past approaches have not satisfactorily overcome. It is the provision of that solution which is the most important of the advantages in the recommended approach.

Other significant benefits to the citizens and governments of the Region can include:

1. Greater assurance of an adequate water supply and improved environmental quality.
2. Probable financial savings--possibly translatable into reduced service charges or lower taxes--because of economies of scale which would be realized (a) in borrowing funds for capital improvements, (b) in the construction of such improvements, and (c) in the operation of facilities.
3. Improved ability by the Region's governments, through the sharing of costs, to utilize emerging technology for recycling solid wastes, the cost of which is likely to exceed the individual funding capability of most jurisdictions.
4. Resolution of controversial issues, which now require difficult policy decisions by individual local governments, within the framework of an areawide perspective responsive to the needs of the entire Region.
5. Relief from pressures created by existing debt limitations on individual jurisdictions.
6. A representative entity authorized to speak for the entire National Capital Region in basin water resources management programs and in other State and Federal programs affecting the development of the metropolitan area.

7. In addition, if the concept of a Regional Council is accepted, this would result in establishment of a regional institution which, if the interstate compact so provides, could be assigned oversight responsibilities in other service or resource management areas which in the future may demand regionwide organization and policies.

One final advantage merits mention. By strengthening the governing of this metropolitan area through the adoption of the dual institutional structure recommended in this report, the National Capital Region would become a highly visible model for the restructuring of local government in other metropolitan areas in the Nation. In so doing, the Region's action also would point the way toward the development of new regional institutions in these areas which can assure achievement of the President's goal in the New Federalism of returning decision-making power to State and local governments.

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APPENDIX A

EXAMINATION AND EVALUATION OF EXISTING AND ALTERNATIVE INSTITUTIONAL ARRANGEMENTS FOR WATER QUALITY MANAGEMENT IN THE WASHINGTON METROPOLITAN AREA

Lloyd H. Rooney & Norman D. Radford

WATER QUALITY OFFICE
ENVIRONMENTAL PROTECTION AGENCY
CHARLOTTESVILLE, VIRGINIA
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EXAMINATION AND EVALUATION
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I

INTRODUCTION

In 1961 President John F. Kennedy promised the nation that we would land men on the moon within the decade. In 1965 President Lyndon B. Johnson pledged that the Potomac River would be reopened for swimming by 1975.[1*] Americans were on the moon within ten years of President Kennedy's promise, but the fulfillment of President Johnson's pledge is still in doubt. How can we fail to clean up the Potomac by 1975 when we were able to send men to the moon with a ten-year program?

In 1961 the National Aeronautics and Space Administration (NASA) had money but lacked the organization and technology to put men on the moon. In the next eight years NASA pioneered in management and organization as well as technology. NASA didn't just talk "operations research," it put it to use.

The effort to clean up the Potomac in the Washington Metropolitan Area lacks both money and organization. We are not sure we are preserving, let alone enhancing, the river's quality. Surveys by the Water Quality Office of the Environmental Protection Agency show that the Potomac River at Washington is still polluted.[2]

The problem of a polluted Potomac was recognized well before President Johnson's pledge in 1965. The first Potomac River-Washington Metropolitan Area Enforcement Conference session was held in 1967, and it was followed by a second session in 1968. The third session of the Enforcement Conference began in 1969 and is still continuing. However, defining the level of water quality and establishing what should be done will be of no avail without an organization, institution, or agency to implement the pollution control program.[3]

Purpose

The purpose of this study is to advance the time when the Washington Metropolitan Area will have an organization or organizations which can effectively implement a water quality management program to achieve the desired water quality in the Potomac River. This investigation hopes to fulfill the above purpose by examining and evaluating the existing water pollution control structure, alternative arrangements within the present legal framework, and alternatives requiring legislative changes.

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* Footnotes are cited at the end of the text.

Congress recognized the need for a unified approach in 1960 when it declared in the Washington Metropolitan Regional Development Act that, "...priority should be given to the solution, on a unified metropolitan basis, of the problems of water supply, sewage disposal, and water pollution."[4] The Potomac River-Washington Metropolitan Area Enforcement Conference (hereinafter cited as Enforcement Conference) has not specifically called for new organizational arrangements, but Recommendation 4 of the Third Session does call for the initiation of:

> "...detailed analyses of alternative methods of meeting future water quality requirements and sewage needs in the metropolitan area. These analyses shall consider advances in waste treatment technology; space limitations which prevent unlimited expansion of the District of Columbia and other water pollution control plants; fail-safe sewer systems to prevent raw sewage discharges; possibilities for load transfer to other sewage treatment plants; opportunities for use of reclaimed water; sewers and alternate treatment plants and discharge points for treatment facilities and sludge disposal methods needed for the expanding Washington population."[5]

To implement a program including the above elements will require a not-yet-reached, and perhaps impossible, level of coordination between the existing waste water disposal organizations or, more likely, a new institutional arrangement.

The goal should be an institutional arrangement that can achieve and maintain desired water quality quickly and in an efficient manner and still be politically responsive and acceptable. To date, discussions of water pollution in the Potomac River have focused almost entirely on technical problems. It is time for serious discussions of institutional alternatives.

The quality of the Potomac River should be and can be improved. The main reason that pollution still exists in the Potomac is that the planning and construction of treatment facilities has not kept pace with the large increases in population.[6] Thus, the technological problems are easier in the Washington Area than in most metropolitan areas because the pollution results largely from domestic waste water, and there are only a few industrial discharges. It may be argued that the technology required to meet all the Potomac's water quality standards is not presently available, but there is no doubt that sufficient methods are available to allow a significant improvement in the river's quality. The citizens of the Washington Area also appear ready and able to pay the price of enhancing the quality of the Potomac River.[7] Only an effective institutional arrangement is lacking.

Scope

The Washington Standard Metropolitan Statistical Area (SMSA), as defined by the Office of Management and Budget, plus Charles County, Maryland, is the geographic area of interest. The Washington SMSA includes Montgomery and Prince Georges Counties in Maryland; the District of Columbia; and Arlington, Fairfax, Loudoun, and Prince William Counties and the Cities of Alexandria, Fairfax, and Falls Church in Virginia. Charles County, Maryland was added because it is the future site of treatment plants serving both Charles County and Prince Georges County and because there are projections which indicate a rapid population increase in the next 20 to 30 years. It hasalready been named as the site of one of the "new cities" being developed in the Washington Area.[8]

This study concentrates on the water supply and waste water disposal agencies in the Washington Metropolitan Area and alternatives to them. However, other governmental organizations which significantly influence water supply and waste water planning and operations are also discussed.

The investigative effort included three major phases. First, the Virginia, Maryland, District of Columbia, and Federal statutes were reviewed to determine the existing legal framework for the organization of water supply and waste water disposal agencies. Next, the available literature was surveyed to determine the institutional arrangements in other areas of the country and to establish some basic features which should be present in an effective water quality management organization. The third part of the study consisted of "off-the-record" interviews with high level personnel in ten major organizations which provide water supply, waste water disposal, and planning services for the Washington Metropolitan Area.

General Format

A short discussion of whether water supply and waste water disposal services should be provided by a single agency or by two separate agencies comprises the first section of this paper. It is a question fundamental to the evaluation of existing and alternative water quality management organizations.

The next section deals with the existing and alternative institutional arrangements at the Metropolitan Area level. The discussion includes a description of the existing arrangements, alternative arrangements permitted by the present legal framework, and alternative organizations which would require legislative changes. It is followed by a discussion of the influence of Potomac River Basin organizations on water supply and water quality management decisions in the Metropolitan Area. Other sections examine the existing and alternative institutional arrangements in Northern Virginia, Suburban Maryland, and the District of Columbia, individually.

II

SHOULD WATER SUPPLY AND WATER QUALITY MANAGEMENT ACTIVITIES BE COMBINED IN A SINGLE AGENCY?

This is a basic question which must be considered when evaluating institutional arrangements for water supply and water quality management. The literature is deficient in discussion of the question, but if the answer is taken from actual practices, it would be "yes and no." There is variation throughout the country and within the Washington Area. Philadelphia, Pennsylvania, has a single agency for water supply and water quality management, while Chicago, Illinois, has two separate agencies. In the Washington Area, Suburban Maryland is provided both water and sewer services by the Washington Suburban Sanitary Commission (WSSC), while in Fairfax County, Virginia, water service is supplied by the Fairfax County Water Authority (FCWA) and sewer service is provided by the Public Works Department. The District of Columbia Department of Sanitary Engineering provides sewage collection and treatment and water distribution services, but the U. S. Army Corps of Engineers is responsible for providing the District with finished water.

There are several strong arguments in favor of combining water supply and water quality management in the same agency. The basis for these arguments is that there is a strong tie between considerations for water quality and water quantity.[9] Water supply and sewage disposal are, in effect, two phases of the single function of water resource management. Because of this close relationship between water quality and quantity, there are more alternatives available to an agency combining the two activities. A dual-purpose agency can vary its operations to arrive at the optimum levels of sewage treatment, water quality, and water treatment. A single-purpose water supply agency would have very little flexibility because its level of water treatment is dictated by the raw water quality.

Combining water supply and water quality management functions also reduces administrative costs. There only has to be one headquarters building, one payroll unit, one billing unit, and one set of administrators. Duplication of maintenance forces and equipment and laboratory personnel and equipment is avoided, and contracts for the purchase of supplies and services common to the two functions should attract lower unit prices due to the increase volume. The combined organization also reduces governmental fragmentation. Planning is simplified because the local planning agency only has to deal with one group when considering water and sewer services. The combined organization should ensure that water and sewer expansion is consistent. Sewer lines should follow water mains, as the flows are related.

There are only a few arguments against combining water supply and water quality management activities in a single agency. One disadvantage is that one function may be favored over the other. However, this problem should not occur with good management and a watchful public. A second problem is that it is more difficult to initiate a dual-purpose agency than a single-purpose one. There are two groups of opposition to overcome rather than one, and one of the two special interest groups may be especially powerful. For example, some professionals in the Washington Area believe a metropolitan sewer authority would be easier to achieve than a water and sewer authority, because the people in the area are more sensitive about their water supply and the question of dams in the Potomac River Basin.

Despite the above problems, a dual-purpose water supply and water quality management agency is superior to separate agencies on the basis of economics, engineering, and planning. This is clearly evident when water reuse is being practiced or considered. The Delaware River Basin Commission and the Ruhr Genossenschaften in Germany have both water supply and water quality functions.[10] In the Washington Area, water reuse is being subtly practiced in the Occoquan Creek Watershed and is being considered for the Potomac Estuary.[11] At present there are several agencies discharging waste water into Occoquan Creek and the Potomac Estuary and other agencies using or considering them for water supply. This institutional arrangement can and should be improved.

III

EXISTING AND ALTERNATIVE INSTITUTIONAL ARRANGEMENTS AT THE WASHINGTON METROPOLITAN AREA LEVEL

Existing Arrangements

Although there is no regional water supply and water quality management organization in the Washington Metropolitan Area, and there would be significant opposition if one were seriously proposed; the physical facilities for water supply and water quality management are regionalized to a surprising degree. Just as the District of Columbia is the geographic heart of the Metropolitan Area, its water and sewerage systems also serve as the heart of the physical regionalization that already exists.

Water from the Washington Aqueduct serves all of the District of Columbia, and, under contractual agreement, it is the source of supply for Arlington County and part of Fairfax County, the City of Falls Church, and the Town of Vienna. The District of Columbia Water System also serves Andrews Air Force Base in Maryland. Most of the Virginia portion of the Metropolitan Area is supplied with water by the FCWA, and WSSC supplies most of the Maryland portion. The FCWA only has a small connection with the D.C. system through Falls Church.[12] There are 11 small connections between the D. C. and WSSC systems, but no significant transfer of water.[13] Together the D. C. Water System, the FCWA, and the WSSC supply over 95 percent of the water used in the Washington Metropolitan Area.[14]

The District of Columbia Water Pollution Control Plant receives nearly 80 percent of the Metropolitan Area's sewage load.[15] The District receives sewage from the WSSC service area and from parts of Arlington and Fairfax Counties under individual contractual agreements. Additional sewage from the WSSC service area and from Fairfax and Loudoun Counties is received under agreements provided for in the legislation authorizing the Potomac Interceptor.[16]

Despite this degree of physical regionalization, the Potomac River is still being polluted. The planning and construction of sewage treatment facilities by the many local units responsible for the provision of sewerage services has not kept pace with the large increases in population. The Metropolitan Washington Council of Governments, the Potomac River Enforcement Conference, and the Federal Government are the major organizations influencing water supply and water quality management decisions at the Metropolitan Area level.

Metropolitan Washington Council of Governments

The Metropolitan Washington Council of Governments (COG) is a voluntary association of elected local, State, and Federal officials representing all of the jurisdictions included in this report except Charles County, Maryland. The members of the governing body of Charles County are eligible for membership under Article 6 of COG's articles of incorporation, but they are excluded from participation by Section IIa of the bylaws. The purpose of COG is to promote cooperative, coordinated action among the member governments on areawide problems. The Council was established in 1957 and named the Metropolitan Regional Conference. The present name was selected in 1962, and in 1965 the Council incorporated under the District of Columbia Nonprofit Corporation Act. In 1966 the President recognized the value of COG and abolished the National Capital Regional Planning Council because COG was a more effective planning agency. The President said that comprehensive regional planning is vital to the orderly development of the National Capital Region and noted the following:

> To be most effective, regional planning must be a responsibility of the area's State and local governments acting together to solve mutual problems of growth and change. It should not be a Federal function, although the Federal Government should support and advance it.[17]

COG is the Metropolitan Area's official regional planning agency and is the area's designated clearinghouse for those Federal programs covered by Office of Management and Budget Circular A-95. In this capacity it prepares regional plans to allow the participating jurisdictions to qualify their projects for certain Federal grants and reviews project grant applications for consistency with the regional plans. The Basic Water and Sewer Facilities grants of the Department of Housing and Urban Development and the Waste Treatment Facilities grants of the Water Quality Office are two of the programs included within the scope of Circular A-95.

COG has been active in water supply and water pollution control activities since its inception. It has commissioned a 1962 report on sanitary sewers and waste water disposal in the Washington Metropolitan Region,[18] a 1967 report on future water supply requirements and sources, and a 1968 report of the need for future water supply facilities.[19] In 1966 COG established a Department of Environmental Health and hired a full-time Director. Advising COG on technical matters is the Regional Sanitary Advisory Board. The Board is composed of sanitary engineers and other officials from the jurisdictions represented in COG, and its primary purpose is to promote regional cooperation in water supply and water quality management activities. COG has also established a Regional Sediment Control Advisory Committee to provide leadership in the development of a unified sediment control program for the Metropolitan Area.

One of COG's most innovative efforts has been the establishment of the Metropolitan Washington Waste Management Agency.[20] The Agency was incorporated in 1967 in the District of Columbia as a nonprofit corporation and has the same Board of Directors and staff as COG. The corporation's articles of incorporation state that its purpose is to plan, acquire, develop, and manage facilities for the treatment, utilization, and disposal of liquid and solid wastes in the Washington Metropolitan Area. The Metropolitan Area is defined as including the present COG jurisdiction plus Charles County. Thus, the area is the same as used in this report.

Although its articles of incorporation were drafted to permit both liquid and solid waste disposal activities, the Metropolitan Washington Waste Management Agency was conceived primarily to provide solid waste disposal facilities. Perhaps it is because of this that the Agency is so seldom mentioned in discussions of water quality management alternatives in the Metropolitan Area.

COG is making progress toward a goal that would have the Agency begin operating solid waste disposal facilities. There is no intention to provide any local collection of either solid or liquid wastes. As originally planned, the nonprofit corporation would be the first step in a two-step approach to a regional special district government providing solid and liquid waste disposal services. Ideally, the success of the nonprofit corporation would aid the acceptance and approval of the regional special district government. COG decided to begin the nonprofit corporation stage without liquid disposal activities because waste water disposal is more than strictly a service function. Waste water disposal requires some regulatory powers to control connections to the system and has a significant impact on land use. This would have made it difficult for the corporation to fulfill its goal of supplementing rather than supplanting the functions, rights, and prerogatives of the local governments.

Potomac River Enforcement Conference

The Conference in the Matter of Pollution of the Interstate Waters of the Potomac River (Washington Metropolitan Area) is presently in its third session since it was first convened in 1957. The Conference was called by the Secretary of the Interior under Section 10 of the Federal Water Pollution Control Act[21] and is an effort by the water pollution control agencies of Virginia, Maryland, the District of Columbia, and the Federal Government to analyze the problem of water pollution in the Potomac and agree on a pollution abatement program. The agencies officially represented as Conferees are the Virginia State Water Control Board, the Maryland Department of Natural Resources, the Maryland State Department of Health, District of Columbia Health Services Administration, the District of Columbia Department of Sanitary Engineering, the Interstate Commission on the Potomac River Basin, and the Water Quality Office (WQO).

The Conferees at the Third Session of the Potomac River Enforcement Conference have made 15 recommendations to bring about pollution abatement and enhance the quality of the Potomac in the Washington Metropolitan Area.[22] The recommendations range from waste load allocations to soil erosion control to public progress meetings. A serious limitation of the Enforcement Conference is that it includes only part of the Washington Metropolitan Area. The Conference area presently includes the 26-mile reach from Little Falls to Hallowing Point and the tributaries to it. This excludes Loudoun and Prince William Counties in Virginia from the Conference area; yet they are part of the Washington SMSA, and their rapidly growing populations are a threat to any improvement in the Potomac's quality. Serious pollution problems already exist in Occoquan Creek,[23] a tributary of the Potomac, and their solution may involve increasing the quantity of pollutants discharged directly into the Potomac.[24] The present Conference boundaries also exclude Charles County, Maryland, which will probably soon be experiencing a population boom and will be the site of future sewage treatment plants serving both Prince Georges and Charles Counties. The jurisdiction of the Enforcement Conference should be expanded to include Loudoun and Prince William Counties in Virginia and Charles County in Maryland.

Federal Government

The Federal Government influences water quality management in the Washington Metropolitan Area in a multitude of ways. As the largest employer in the area, its decisions as to the location of major installations have a significant impact on housing patterns and, thus, the location of water mains and sewage interceptors. An example of this was the decision to build Dulles International Airport in eastern Loudoun County and the resulting impetus to growth in western Fairfax County and eastern Loudoun County. Fortunately, because the natural drainage from the airport area is to the Potomac River upstream from the District of Columbia's water intake, the Federal Government took an active role and provided for the construction of the Potomac Interceptor.[25] The interceptor is designed to carry sewage from the airport and those areas of Virginia and Maryland tributary to the interceptor route into the District of Columbia sewerage system for treatment at the D. C. Water Pollution Control Plant. This is the only instance where the Federal Government has acted directly to aid the local governments in providing sewerage facilities for new Federal installations and federally induced development, but even here the Federal aid was incomplete. The Federal decision directing the District of Columbia to build the Potomac Interceptor added to the District's water pollution control responsibilities and obligated the District to provide for an additional 64 mgd of sewer and sewage treatment capacity within its own system by the year 2000.[26] The interceptor has been built, but the District's sewer and sewage treatment plant construction programs have not received sufficient funding to enable the District to handle the interceptor's increasing sewage flows.

The environmental impact of such projects as the Potomac Interceptor will receive closer scrutiny in the future under a recently adopted plan of the National Capital Planning Commission.[27] Under the plan, all District and Federal agencies planning projects in the National Capital Region must submit to the Commission details of how the project will affect the environment. The main advantage of this is that the environmental statements will be open to the public for review and comment. The National Capital Planning Commission is responsible for comprehensive planning in the District of Columbia and for the planning of Federal and District installations in the National Capital Region.[28]

The employment levels of the Federal Government also have a major affect on area planning for water supply, sewers, and sewage treatment needs. The rate at which Federal employment levels will increase is a major factor in predicting future levels of population which must be served.

The Federal Government plays a more direct role in water quality management activities in the Metropolitan Area through the operation of water supply and sewage treatment facilities on Federal installations, through the programs of the Water Quality Office and the provisions of the Federal Water Pollution Control Act, and through the activities of numerous other Federal agencies.

Federal Water Supply and Sewage Treatment Facilities - The Federal Government operates at least ten sewage treatment plants and two water supply systems in the Washington Metropolitan Area. In Northern Virginia, Federal sewage treatment facilities are located at the Pentagon, Fort Belvoir, and the Quantico Marine Base. The Quantico Marine Base also has its own water supply system. In the Maryland portion of the Metropolitan Area there are sewage treatment plants at Andrews Air Force Base, the Naval Communications Station at Cheltenham, and the Navy Propellant Plant at Indian Head. The Navy also operates a ground water supply system at Indian Head. The Army Corps of Engineers operates the Washington Aqueduct to supply the District of Columbia with finished water. It is the largest water supply system in the area.

Section 21(a) of the Federal Water Pollution Control Act, as amended, requires that all Federal agencies comply with applicable water quality standards so long as that compliance is consistent with the paramount interests of the United States as determined by the President. Executive Order 11507 establishes the policies and procedures which Federal activities must follow in the prevention, control, and abatement of water pollution.[29] The order calls for Federal leadership in the effort to improve water quality and states that where feasible the use of municipal sewerage systems is the preferred method of disposal.

Water Quality Office of the Environmental Protection Agency - The Federal Water Pollution Control Act, as amended, is administered by the Water Quality Office (WQO). The Washington Metropolitan Area is in the WQO's Middle Atlantic Region, and Federal water pollution control activities in the area are directed from the Middle Atlantic Region headquarters in Charlottesville, Virginia. However, because the Potomac flows through the Nation's capital and many governmental leaders take a personal interest in it, much of the Federal policy for the Potomac River is formulated at relatively high levels in Washington.

The Federal Water Pollution Control Act, as amended, gives the WQO several means of influencing or guiding water quality management in the Washington Metropolitan Area and throughout the rest of the country. Section 10 of the Act was used to call the Enforcement Conference described above. Section 7 of the Act authorizes grants to States and interstate agencies to assist them in establishing and maintaining water pollution control programs. To be eligible for a Federal grant, each program plan must be approved by the WQO; and, if the plan is not followed, payment of the grant may be stopped.[30] Thus, the Virginia State Water Control Board; the Maryland Departments of Health and Mental Hygiene, and Natural Resources; and the District of Columbia Health Services Administration must follow program plans which meet with WQO approval if they want to receive Federal funds for their operations.

Research and development activities and funding provided for in the Act don't relate directly to the administration of water quality management programs, but they do promote technical development and, thus, increase the number and scope of activities which must be administered. Such research and development activities are in progress at the Greater Manassas Sanitary District Sewage Treatment Plant, at the WSSC's Piscataway Sewage Treatment Plant, and at the D. C. Water Pollution Control Plant. A portion of the money provided for research and development grants should be diverted from purely technical studies and used for investigating new administrative and management techniques, arrangements, and institutions. This is necessary to reduce the growing gap between what is technically possible and what is administratively possible. Today money is probably the major limitation in the national effort to improve water quality; tomorrow it will probably be technology, but administration is also a factor limiting water quality improvement in many parts of the Nation.

Although not in use in the Washington area, the Federal Water Pollution Control Act, as amended, authorizes grants to pay up to 50 percent of the expenses involved in developing an effective, comprehensive water quality control and abatement plan for the Basin. If a Federal grant is used, the plan developed must meet criteria set by the Act and is thus open to Federal influence. The greatest Federal control over water quality management activities in the Washington Metropolitan Area comes through its construction grants program. The Federal Water Pollution Control Act, as amended, provides increasingly larger grants to projects if (1) the State pays at least 30 percent of the cost for all projects receiving Federal grants, (2) the State pays at least 25 percent of the cost for all projects receiving Federal grants and if the project discharges into waters protected by enforceable water quality standards, and (3) the project is in conformity with the comprehensive plan for a metropolitan area. Thus, the State-level jurisdictions in the area have an incentive to give financial aid to local pollution control projects, and the local agencies have an incentive to plan their facilities in conformity with the comprehensive plan for the Washington Metropolitan Area.

What "the" comprehensive plan is and which organization is responsible for developing it are questions which have not yet been resolved by the State-level jurisdictions. The Governors of Virginia and Maryland and the Commissioner of the District of Columbia have yet to designate the agency which is to certify the water pollution control projects that are in conformity with the comprehensive plan developed or being developed for the Metropolitan Area. The Metropolitan Washington Council of Governments has been designated by the Department of Housing and Urban Development as the official reviewer for Federal funding assistance in over 35 different programs,[31] but such designation is not sufficient for the WQO's construction grants program. This gap in the water quality management effort in the Washington Metropolitan Area is an example of the problems created by the area's interstate nature and insufficient cooperation between the jurisdictions.

The WQO has recently strengthened its policy of ensuring that water pollution control projects receiving grants are part of an effective basinwide and regional or metropolitan plan of pollution abatement. On July 2, 1970, new regulations were published requiring a project to be part of an approved basinwide plan and, where applicable, part of an approved regional or metropolitan plan before a grant can be made.[32] These new regulations require the development of a water pollution abatement plan in the Washington Metropolitan Area and the certification of that plan by the Governors of Virginia and Maryland and the Commissioner of the District of Columbia, or their designees. The preliminary document which the WQO has prepared for the use of the States in complying with the new regulations indicates that the regional or metropolitan pollution abatement plans must identify the responsible implementing agency or agencies and the specific powers, responsibilities, and geographic areas of jurisdiction of each agency. This is a major step toward recognizing the importance of adequate institutional arrangements in implementing a water quality management program.

Other Federal Agencies - In addition to the WQO, many other Federal agencies have programs which influence water quality management activities in the Washington Metropolitan Area. The water resources programs of the U. S. Army Corps of Engineers have the largest potential influence. In 1963 the Corps recommended the construction of 16 major reservoirs in the Potomac River Basin for water supply, low flow augmentation (water quality), recreation, and flood control.[33] The Washington area has the largest flow requirements in the basin and at every point in the basin the requirements for water quality control greatly exceed the flow needed for water supply.[34] Because of public opposition to many of the proposed reservoirs, the President directed the Secretary of the Interior to review the Corps' plan and recommend an alternative plan. The report by the Department of the Interior reduced the number of recommended reservoirs to six.[35] The construction of these six reservoirs will give the Corps major influence on water quality management in the Metropolitan Area. The Corps is playing a lesser but more noticeable role in improving the appearance of the Potomac at Washington through its debris collecting operations.[36]

The Department of Housing and Urban Development is another Federal agency which can exert significant influence on a water quality management program in the Washington Metropolitan Area. Under the Housing and Urban Development Act of 1965, as amended, the Department may provide grants for the advance acquisition of land that communities will need as future sites for public works facilities and grants to pay for up to 50 percent of the costs for basic public water and sewer facilities, other than sewage treatment works.[37] No grants for sewer facilities can be made unless the Secretary of the Interior certifies that any waste material carried by the facilities will be adequately treated and unless the facilities are consistent with the area's comprehensive plan. Supplemental grants may be made to local bodies for the provision of basic water and sewer facilities to "new communities" developed by private developers who have Federal loan guarantees.[38]

The provision of grants for comprehensive planning is another way in which the Department of Housing and Urban Development influences water quality management in the Washington area. Grants of up to two-thirds of the cost of a planning project can be made to various types of planning agencies, including organizations of public officials such as the Metropolitan Washington Council of Governments and official regional planning agencies such as the Northern Virginia Planning District Commission and the Maryland-National Capital Park and Planning Commission.

Several Federal agencies play lesser,but potentially powerful, roles in the water quality management effort in the Metropolitan Area. The Soil Conservation Service of the Department of Agriculture provides technical and financial assistance to the local governments and soil and water conservation districts for watershed development, flood prevention, and soil and water conservation. Within the Department of the Interior, the Geological Survey collects water resources data and conducts water resources investigations, and the Bureau of Outdoor Recreation provides financial assistance for outdoor recreation facilities. The Bureau of Sport Fisheries and Wildlife may comment on landfill permit applications submitted to the Corps of Engineers. It was opposition by the Bureau that was the basis for the defeat of a proposal to fill in several acres of submerged land at Hunting Creek in Alexandria. The Department of the Interior also blocked expansion of the D. C. Water Pollution Control Plant by withholding the approval needed to reclaim 51 acres of mudflats adjacent to the existing site.[39] The National Park Service of the Department of the Interior may become involved in water quality management decisions because of its extensive parks bordering Rock Creek and the Anacostia and Potomac Rivers. The National Park Service has denied the WSSC permission to construct an outfall line from the Piscataway Sewage Treatment Plant across Park Service land to the Potomac River. This refusal has resulted in very serious problems in Piscataway Creek which is now receiving the treatment plant's effluent.

Institutional Problems at the Metropolitan Area Level

Fragmentation of water supply and water quality management functions and responsibilities is a problem in the Washington Metropolitan Area. The Conferees at the Potomac River Enforcement Conference represent one Federal, one interstate, and five State-level organizations. Consideration of water supply problems adds at least one Federal-level, the Corps of Engineers, and one State-level, the Maryland Potomac Water Authority, organization. Actual provision of sewerage service is the responsibility of at least 32 local governmental and five private organizations. Efforts to solve the area's water supply and pollution control problems must also include at least one regional and three subregional planning agencies. Thus, a minimum of 50 different units in the Metropolitan Area are directly involved with water supply and/or water quality management. This fragmentation makes the formulation and acceptance of an areawide water supply and pollution abatement plan very difficult, and it makes the implementation of such a plan exceedingly difficult. The numerous local units referred to above are described in the sections of this paper dealing with Northern Virginia, Suburban Maryland, and the District of Columbia as separate entities.

Other than the Federal Government and the Interstate Commission on the Potomac River Basin, COG is the only organization involved that has close to areawide coverage, and it must depend on the voluntary cooperation of its members. COG has been effective in obtaining a regional approach to many studies, but few, if any, operating activities. Because development is largely shaped by the planning and provision of sewerage facilities, the local jurisdiction will be very reluctant to surrender their control over them. COG is already having difficulty in persuading the Northern Virginia Planning District Commission and the Maryland-National Capital Park and Planning Commission to accept its ideas for an areawide master plan.

Areawide Institutional Alternatives Within Existing Law

A variety of areawide organizational structures for the provision of water supply and water pollution control facilities could be provided under the existing State and Federal legislation, but each would have to be based on contractual agreements among the various governmental units. In Virginia it is clear that any county, city, town, water and/or sewer authority, and sanitary district could contract with other political subdivisions of the State or with individuals, associations, and corporations within the State, or with the Federal Government for the sale or receipt of water and sewerage services.[40] However, there is some question as to the authority of a county, town, city, or sanitary district to contract with political subdivisions, individuals, associations, or corporations in an adjoining state. Only water and sewer authorities have specific power to contract with political subdivisions, individuals, corporations, or units of an adjoining state for projects partly in Virginia and partly in the adjoining state.[41] There are no code provisions specifically prohibiting cities, counties, towns, and sanitary districts from contracting with political subdivisions, individuals, or corporations in an adjoining state in regard to water and sewerage services, but the grant of contracting authority is limited to agreement between political subdivisions in "this State" at several places in the Virginia Code.[42] Other provisions of the code, including those applicable to service districts, have neither the limiting phrase "in this State" nor specific reference to adjoining states.[43] Arlington and Fairfax already have sewerage contracts with the District of Columbia, but the District Government could be considered as the Federal Government rather than as an adjoining state. In all probability the statutes would be liberally construed, and the governments in Northern Virginia would be able to contract with governmental units or corporations in Maryland with regard to water and sewerage services. In any event, a water and sewer authority could be used as the contractual medium between Virginia and Maryland governmental units.

The Maryland General Assembly has given explicit authority for the WSSC and county sanitary districts to contract with the Federal Government and political subdivisions, corporations, or individuals within the State or in adjoining states.[44] Municipalities are not specifically prohibited from contracting with political subdivisions, individuals, or corporations in adjoining states,[45] and they would probably be permitted to do so for the purpose of providing or receiving water and sewer services. All state and local authorities can enter into contracts with the WSSC[46] and the WSSC could then contract with the governmental unit or corporation in Virginia.

The District of Columbia has clear authority to contract for the provision of sewerage services[47] and water[48] with the adjoining areas in Maryland and Virginia. The power to contract for the receipt of such services is not specifically given, but payments from the D. C. Sanitary Sewage Works to governmental units in Maryland for sewerage services are authorized.[49] This may be the only authority for the receipt of services which is needed, because the Washington Aqueduct would logically be the provider of the water for the Metropolitan Area, and it is doubtful that any District sewage or partially treated effluent would go to Virginia rather than Maryland.

Any areawide water and/or sewerage organization created by contractual agreement or by any other means will in all probability provide wholesale service to the local units which would in turn provide retail service. The areawide organization would operate intake works, water filtration plants, water transmission lines, sewage interceptors, and sewage treatment plants. The areawide organization would have to work with or around the Washington Aqueduct, because the Aqueduct's position can only be changed by Congressional legislation.

The areawide organization could be a nonprofit corporation such as COG's Metropolitan Washington Waste Management Agency or an existing unit such as the WSSC or the D. C. Department of Sanitary Engineering extending its service area through contractual agreements. The WSSC could perhaps provide areawide wholesale water and sewerage services with its present powers, but the D. C. Department of Sanitary Engineering would need new legislation to operate facilities, other than the Potomac Interceptor, outside the District.

There are probably more disadvantages than advantages to arrangements providing areawide water and/or sewerage services through strictly contractual agreements. The areawide contractual arrangements would enable larger scale operations. This would reduce the unit cost of providing the services, and it would be done without adding an additional level of government. The smaller water and sewerage systems in the area would benefit from the areawide organization's technical and financial capabilities.[50] This assumes that the intergovernmental water and sewerage services contracts would aide the bonding position of the areawide organization. A major advantage of an intergovernmental agreement is that it would probably be more politically acceptable. Its political acceptability, however, sometimes derives from the weaknesses built into such agreements. They are often short-term or carry "at will" termination clauses which can be a cause of concern to both the purchaser and the supplier.[51] Other problems with intergovernmental contractual arrangements are that they can take several years to negotiate, the supplier of the services is often in a position to dictate contract terms, and the purchasing government is not represented in the supplying agency's decisionmaking. It is unlikely that an areawide water supply and/or sewerage organization based merely on voluntary contractual agreements would possess the necessary powers to solve the serious and complex water supply and water quality management problems facing the Washington Metropolitan Area. The debate over present and future capacity rights at the overloaded District of Columbia Water Pollution Control Plant attests to the problems that can occur from reliance on a contract.

If an areawide water and/or sewerage organization is founded on contractual arrangements, it is likely that it would come about through intergovernmental cooperation or agreements brought about by the Potomac River Enforcement Conference.

Intergovernmental Cooperation

An areawide water and/or sewerage organization based on contractual agreements could be created by the governmental units in the Washington Metropolitan Area to solve areawide problems with an areawide approach. This is essentially what the governments participating in COG are edging toward with COG's creation of the Metropolitan Washington Waste Management Agency described *supra* at page 13. However, the "eagerness" of the participating jurisdictions can be seen from the fact that the Agency was incorporated in 1967 as a nonprofit corporation for the disposal of liquid and solid wastes, and as of this date no effort at all has been made toward organizing the corporation for liquid waste disposal, and only slight progress has been made toward providing solid waste disposal services. The experience of the Metropolitan Washington Waste Management Agency shows that voluntary cooperation is difficult to get.

The long history of water pollution control efforts in the Metropolitan Area, as well as the short history of COG's Waste Management Agency, speaks out against voluntary cooperation as a solution to the area's water quality problems. "Voluntary cooperation" has been voiced time after time by one local agency after another as the answer to the pollution problem, but there is doubt that "voluntary cooperation" is even maintaining the Potomac's already low quality. There is no doubt that "voluntary cooperation" is failing to improve the river's quality. It is time for a change!

Potomac Enforcement Conference

Under Section 10 of the Federal Water Pollution Control Act, the Secretary of the Interior may conclude the Potomac Enforcement Conference and recommend appropriate remedial action by the State water pollution control agencies; and if reasonable action is not taken, the Secretary may call a public hearing before a Hearing Board whose recommendations are legally enforceable through court action.[52] It has been suggested that the Secretary of the Interior take this action.[53] The major advantages of this step would be that the existing water pollution control agencies and the governmental units providing sewerage services would be under greater pressure to meet the Secretary's or, if necessary, the Hearing Board's recommendations. Of course, the local governmental units could refuse to comply in hopes of court action favorable to them, but such a course would be unlikely. For better and for worse, politicians at all levels of government in the Washington Metropolitan Area are becoming aware of the public support for a clean environment, and it is doubtful that any governing body would want to be branded as polluters in a publicized court action.

The binding recommendations would not be clouded by the uncertainty of the recommendations made by the Potomac Enforcement Conference. One factor slowing local action on the Conference's recommendations is that they are subject to relatively sudden change. It is doubtful that any binding recommendations would specifically call for intergovernmental contracts, but the increased pressure to reach a workable solution could lead to them.

Alternative Institutional Arrangements Requiring Legislative Changes

Before discussing several alternative arrangements for providing water supply and/or sewerage services in the Washington Metropolitan Area, it may be appropriate to look some more at why an areawide organization is needed and what criteria should be used in evaluating it. Because the D. C. Water System, the FCWA, and the WSSC supply over 95 percent of the water used in the Washington Metropolitan Area, because all three systems have good service records, and because all three have different fiscal foundations, a board of engineers reporting to the Metropolitan Washington Council of Governments in 1968 concluded that there was no obvious advantage in consolidation of the three units into one organization.[54] However, they did encourage the continued consolidation of smaller water systems into one of the three major systems and the diversion of water from one system to another to allow a more economical arrangement of facilities.[55] A 1962 sewerage study also commissioned by COG said that present orthodox administrative structures or those to be developed in the future are appropriate for the sewerage functions, and an overlying sewerage authority for the Metropolitan Area is not contemplated.[56] In the face of these reports, why is an areawide water and/or sewerage organization needed?

The case for an areawide water supply organization is harder to make than one for an areawide sewerage agency, but it can be made. Besides encouraging the consolidation of smaller water systems into one of the three major systems and the transfer of water between systems, the board of engineers reporting to COG also recommended that the increasing costs of water supply be spread through contractual agreements for joint projects. The problems with contractual agreements have already been discussed supra, and they would not be present with a single areawide organization. Why did the Board of Engineers recommend consolidation into three water systems rather than a single areawide system? The Board said we should not attempt to have regional uniformity at present because of the legal and financial chaos, and political battles which would result. The Board thus indicated that regional uniformity would be needed sometime in the future. Admittedly, it will be difficult to move from the existing organizational structure to a single areawide system, but the task will not be easier tomorrow; and with increasing population demands on the water supply, the time for having a single water system is rapidly approaching. The need for an areawide sewerage organization lends indirect support to an areawide approach to water supply because of the argument made earlier in this paper for the administration of water supply and water quality management functions by a single agency. If the necessary effort is made to create a Metropolitan Area water quality management agency, incorporation of a water supply function into the agency should be seriously considered.

The need for an areawide water quality management organization is approaching the critical stage if the water quality problems of the Potomac are to be solved in a rational and efficient manner. There is no doubt that the problems could be solved using the area's existing organizational arrangement, but the price for maintaining the existing arrangement would be very high. The 1962 sewerage report to COG, that said an areawide authority need not be contemplated, reached that conclusion while having in mind the political complexities of creating such an authority and the low probability of its acceptance. The best argument for a significant change from the existing institutional arrangement is the Potomac itself and the history of the existing institutional structure in failing to arrive at an effective water quality management program. "Governmental arrangements are deficient ...if they lead to inaction in the face of legitimate needs."[57]

A regional water quality management agency would be able to mount a continuous systematic and coordinated attack on the pollution problems, instead of the piecemeal palliatives and localized stop-gap measures now being used.[58] A regional approach is especially needed in the Washington Metropolitan Area because the tidal action in the Potomac Estuary carries the pollutants from any one jurisdiction back and forth within the Estuary, with the net result that the pollutants from "downstream" jurisdictions affect the quality of the Estuary section adjacent to "upstream" jurisdictions and vice versa. The tidal action complicates the water quality management problem, and their efficient and economical solution will require a complex, integrated system of water quality management facilities. Only a single areawide agency would be able to achieve the close operating coordination needed for the optimum use of methods such as low-flow augmentation and instream reaeration along with regional treatment plants. The discussion here concerns a regional operating agency rather than an agency to control and regulate the existing sewerage organizations. There are already enough agencies and individuals saying the Potomac should be cleaned up; what is needed is an agency to do it.

A report prepared for the U. S. Advisory Commission on Intergovernmental Relations found that water supply and sewage disposal ranked second only to air pollution control as local governmental activities being most "areawide" in character.[59] Congress has recognized this by declaring in the Washington Metropolitan Region Development Act that "...priority should be given to the solution, on a unified metropolitan basis, of the problems of water supply, sewage disposal, and water pollution...."[60] In evaluating a regional water supply and/or water quality management organization or any other governmental unit, the following criteria should be kept in mind:[61]

1. Jurisdictional area large enough for the benefits from the services provided to be received primarily by the population served.
2. Jurisdictional area large enough to achieve economies of scale.
3. Flexibility to adjust boundaries of its jurisdiction.
4. Legal and administrative power necessary to perform assigned functions.
5. Ability to raise adequate revenue equitably.
6. Structural compatibility with total scheme of government.
7. Political accountability and responsiveness.
8. Political feasibility.

A water supply and/or sewerage organization for the Washington Metropolitan Area could take many forms, but only four basic alternatives will be discussed herein. The four alternatives are a Washington Metropolitan Area Water and Sewerage Authority, modeled after the Washington Metropolitan Area Transit Authority; a State-level areawide operating agency, also based on an interstate compact; a regional government operating agency; and a Federal authority.

Washington Metropolitan Area Water and Sewerage Authority

The Washington Metropolitan Area Water and Sewerage Authority would be a regional service agency providing wholesale water supply and sewerage service to the local agencies. The Authority would own and operate raw water collection, transmission, and filtration plant facilities and sell finished water to local water units for retail distribution and sale. Local organizations would also retain ownership and control of their sewage collection systems, but the Authority would own and operate the major interceptors and the sewage treatment facilities. The local water and sewerage agencies would be compensated for facilities transferred to the Authority.

Because of the interstate character of the Metropolitan Area, the creation of a regional service agency with limited governmental powers requires an interstate compact or agreement among Virginia, Maryland, and the District of Columbia. The Virginia and Maryland General Assemblies and the District of Columbia Council would have to approve the compact. In addition, the U. S. Constitution requires the consent of Congress for such interstate agreements.[62] Congress has recognized the need for such agreements and has directed the Secretary of the Interior to "...encourage compacts between States for the prevention and control of water pollution."[63]

The Washington Metropolitan Area Transit Authority is a regional service agency created by an interstate compact and consented to by Congress. Although created by the State Legislatures, it is an area-level organization with the governing Board of Directors being appointed by and from local rather than State governmental units. The Northern Virginia Transportation Commission, the Washington Suburban Transit Commission, and the District of Columbia Council each may appoint two directors from among their members,[64] except that the D. C. Council may decide to appoint the Commissioner of the District and/or his assistant as directors, rather than choosing from its own members.[65] The appointed directors serve for a term coincident with their terms on the appointing body. The Northern Virginia Transportation Commission and the Washington Suburban Transit Commission were created by the General Assemblies of Virginia[66] and Maryland,[67] respectively, to represent those areas in the Transit Authority.

A similar arrangement could be used to govern a Washington Metropolitan Area Water and Sewerage Authority. Northern Virginia, Suburban Maryland, and the District of Columbia could each appoint two directors to a six-man governing board. The District of Columbia directors could be appointed by and from the D. C. Council. The Suburban Maryland directors could be appointed by and from the Washington Suburban Sanitary Commission, if it were expanded to include Charles County. Ideally, the two Virginia directors would be appointed by a Northern Virginia Service District Commission or Water and Sewer Authority which are discussed later in this paper. The new Virginia unit could replace the existing water and sewer organizations, assume responsibility for their distribution and collection systems, and be the direct link between retail customers and the regional service authority.

The Transit Authority's service area presently embraces the District of Columbia, Arlington and Fairfax Counties in Virginia, and Montgomery and Prince Georges Counties in Maryland. The service area of the regional Water and Sewerage Authority should include the above area plus Loudoun and Prince William Counties in Virginia and Charles County in Maryland. The Patuxent River Watershed areas of Montgomery, Prince Georges, and Charles County should be excluded from the metropolitan service area and be included in a Maryland Environmental Service service district for the entire Patuxent Watershed or be included in some other watershed organization.

The major weakness of the Transit Authority is that its powers and responsibilities are limited to mass transit activities, and it has no control over highway planning or land use. Thus, it may be planning a mass transit line from A to B to C, while a highway department is planning a freeway to carry the same commuter from A to B to C, and the regional planning agency intends to rezone A for open space. A Washington Metropolitan Area Water and Sewerage Authority would not be in as difficult a position, because it will not have a service competitor, and the provision of water and sewerage facilities has a greater influence on patterns of development. It is because of this influence that there will be much opposition to a regional water and sewerage authority. To minimize that opposition and be more responsive to the citizen, control over the location of water distribution and sewage collection systems would be left to the local planning agencies. The Water and Sewerage Authority would have to have control over the planning and general location of major water supply and sewerage facilities such as water transmission lines, sewage interceptors, water filtration plants, and sewage treatment plants. This planning of areawide facilities would be coordinated with COG, the areawide planning agency.

For financing, the Authority would have to rely on revenue bonds and the existing Federal grant programs for water pollution control facilities. Federal grants to interstate agencies are authorized, but the water pollution control agencies of the States involved must approve the projects receiving grant aid.[68] The Authority's Board of Directors would have complete authority to issue revenue bonds, and the Board and the bond market would determine the maximum interest rate and amount of indebtedness. The Board could not pledge the credit of any other governmental unit.

This Washington Metropolitan Area Water and Sewerage Authority would be only a wholesale operating agency. The health and water pollution control agencies in Virginia, Maryland, and the District of Columbia would retain all their regulatory powers over water supply and sewerage facilities in their jurisdictions. Thus, although the Authority would have the power to control the quantities of sewage entering its treatment plants, if the Authority should allow a sewage treatment plant to become overloaded, the appropriate state agency could still impose the now "all-too-familiar" ban on sewer hookups or other sanctions against the Authority.

The regional Water and Sewerage Authority would have all the advantages of any areawide organization, including the ability to provide and operate a combination of water quality management methods which would be cheaper than the present one-track approach of continually increasing end-of-pipe sewage treatment requirements. An areawide water and sewerage authority is the only way the Metropolitan Area could achieve the necessary water supply and sewage treatment coordination to make safe and efficient use of the Potomac Estuary as a source of water. The regional authority would also bring about joint efforts in the planning and construction of water supply and water quality management facilities. These joint efforts result in savings through economies of scale and enlarge the amount of technical and administrative talent available. Continuous areawide water quality management would also be available for the first time. This continuity of planning is mandatory if efficient operating alternatives are to receive serious consideration and if planning is to be flexible enough to allow the late adoption of new processes.[69]

One of the advantages of this particular arrangement is that it allows a balance to be struck between political independence and political accountability and responsiveness. Because the Authority performs an essentially technical function, it will perform best if removed from the ever-changing political pressures. Various forms of political accountability and responsiveness could be built into the compact legislation through the provision of specific guidelines to action on such sensitive matters as selection of sewage treatment plant sites, requirements of public hearings before important decisions can be made, requirements that voting records be published, and provisions for court review of Authority actions. The degree of accountability through the election process could be varied, but it would not be direct under this alternative. The Maryland representatives on the Authority's Board of Directors would be at least three times removed from the electorate. The Maryland citizen first votes for a candidate for the county governing body on the basis of many issues, one or more of which may be water quality. The county governing body then appoints three members to the six-man Washington Suburban Sanitary Commission for fixed four-year terms. The WSSC then appoints two directors to the Authority's Board. The same degree of remoteness would be present in Virginia if directors were appointed by a Northern Virginia Water and Sewer Authority. Political accountability would be much more direct if there were a Northern Virginia Service District Commission, because the Commission members would be elected on issues related to the functions of the Service District, and two of the elected Commission members would be serving on the Authority's Board. There would be a much lesser degree of accountability in the District of Columbia, where Council members are appointed by the President, and the Council then elects two of its members to serve on the Board.

Another advantage of this locally controlled Washington Metropolitan Water Supply and Sewerage Authority is that it is compatible with both the present and possible future governmental structures in the Metropolitan Area. The existing local governmental units would be giving up more problems than powers; and, in the future, this dual-purpose regional service authority could be combined with the Transit Authority and form the nucleus for a multipurpose regional service authority providing additional areawide services.

Most of the disadvantages of a locally controlled regional service authority are also common to other forms of regional operating agencies and special district governments. The regional service authority is another layer of government and does further confuse the citizen and put some governmental functions further from his control. Because it would be relying on revenue bonds, the authority would tend to be conservative in the extension of its services. Its projects must be self-supporting. This becomes a disadvantage when the authority becomes too conservative, and the provision of water supply and water quality management facilities lags behind the need for them.

The major disadvantage of a plan for a Washington Metropolitan Area Water and Sewerage Authority is the difficulty in getting such a plan accepted. It took many years of discussion, debate, and traffic congestion to bring about acceptance of the Washington Metropolitan Area Transit Authority, and there were no mass transit organizations already in existence to oppose it. There are numerous water supply and sewerage organizations in the Metropolitan Area, and many of them can be expected to protect their interests by opposing the creation of a regional water supply and sewerage authority. Much of the public in the area can also be expected to favor continued local control of water supply and sewerage facilities despite its desire for more efficient and economical service and a clean Potomac. People have an especially strong attachment to their water supply facilities, and in the Metropolitan Area the debate over a regional water supply authority would be further complicated by the continuing controversy over upstream dams in the Potomac River Basin. The effort to create a regional water supply and sewerage authority also runs counter to the current public support for more local control of all phases of government. The influential homebuilding industry may not like the trend toward regional action because it dilutes their local influence, but they also fear moratoriums on sewer hook-ups due to the failures of the existing sewerage organizations. One major homebuilder has at least proposed a metropolitan planning authority to ease the sewer crisis.[70]

Other problems which must be considered prior to the creation of a regional water supply and sewerage authority include the combined storm water and sanitary sewers in the District of Columbia and Alexandria and the question of differential water and sewer rates. The combined sewers in the District of Columbia and Alexandria result in raw sewage overflows and bypasses from some of the major interceptors and sewage treatment plants which the authority would be assuming responsibility for. The solutions to these combined sewer problems are very expensive, and that expense must continue to be borne by the District of Columbia and Alexandria, because responsibility for storm drainage is and will remain with the general-purpose governments in the area. The authority may act to solve the water pollution resulting from combined sewers, but that portion of the capital and operating expense due to storm drainage must be paid directly by the District of Columbia and Alexandria. The expenses for the treatment of the raw sewage can be paid through normal wholesale service charges. The authority may also find it necessary to vary its wholesale water and sewer charges according to the population density and the need for new water supply and sewerage facilities in the various jurisdictions. The authority would perhaps be operating on a more equitable and politically acceptable basis if it charged older, developed areas lower rates than new, expanding areas to which facilities have to be extended.

The problems of formulating an equitable rate structure and achieving political acceptance do not reduce the need for a Washington Metropolitan Area Water and Sewerage Authority. Such an Authority could be created if the public were informed of all the factors involved.

Regional Water and Sewerage Authority with State Membership

This alternative organization would be identical to a Washington Metropolitan Area Water and Sewerage Authority except that in place of the directors appointed to the Board from the Washington Suburban Sanitary Commission and a Northern Virginia Service District Commission or Water and Sewer Authority, there would be directors appointed by the Governors of Maryland and Virginia. Since the District of Columbia Council is a State-level organization, it could continue to appoint two directors to the Board. This change to State appointed directors would make a regional water and sewerage authority a creature of the States rather than of the local governments. Because the States, rather than individual communities are responsible for water quality, many people feel it is natural that State Governments should provide for water quality management facilities.

The State-level administration of the regional interstate authority has several advantages over local administration and control. A major advantage is that such an authority might be easier to create. The governments of Maryland, Virginia, and the District of Columbia could create the authority with the consent of Congress. The locally administered authority requires the approval of the State governments, Congress, and the governing bodies of seven counties and three independent cities. The fact that the Maryland and Virginia directors are appointed by the respective governors would perhaps lessen the political tensions created by local interests competing over directorships. Directors appointed by the governors would also be more remote from local pressures for quick or preferential development.

The State-level regional water and sewer authority would be akin to the Maryland Environmental Service, except that the authority would have mandatory control over all major water supply and sewerage facilities. There would be no local option as in Maryland, and the authority would have responsibility for water supply as well as wastewater disposal. The authority's State agency character would give it a wider range of powers and could improve cooperation with the State regulatory agencies.

Of course, many of the above advantages could be viewed as disadvantages. Placing the regional operating authority on the same plane as the State water pollution control agencies may lessen the effectiveness of those regulatory agencies in policing the authority's activities. The appointment of the Maryland and Virginia directors by the respective governors would greatly reduce the political accountability and responsiveness of the authority; and, rather than increasing its political feasibility, it may be a fatal weakness. The authority's State-level character would not be compatible with the present scheme of government in the Metropolitan Area. It would also remain above or outside any future efforts to form a multipurpose regional service agency or government. The interstate authority with the State membership could not easily merge with the locally controlled Washington Metropolitan Area Transit Authority.

A Multipurpose Regional Government

Regional government is one thing most politicians and citizens can agree on today. Both groups think it is a bad concept. Numerous reasons have been given for this assessment of regional government.[71] The local citizens and politicians want to preserve their distinctive perspectives, policies, influence, and identities. Americans have a "gut" feeling that local government is the best guarantee of liberty and protection against arbitrary, inefficient government. A regional government plan becomes a super government to the suburbanite who is fond of his neighborhood, his way of life, and his isolated refuge. The suburbs don't want to be saddled with the problems of the central city. Against these views, arguments of efficiency and economy only have negligible impact on the local point of view. Nevertheless, because of the rising costs of government, efficiency and economy will be the prevailing arguments in the long run.

The Washington Metropolitan Area needs a regional water supply and sewerage agency now; and to get it accepted in the short run, the longer range alternative of a regional government probably must be played down. However, the long-range alternative should not be lost sight of by those organizing a regional water supply and sewerage agency. In 1957 the Washington State legislature passed the Metropolitan Municipal Corporations Act of 1957 which authorized a regional approach for water supply, sewage disposal, public transportation, parks, solid waste disposal, and planning.[72] Later in 1957 voters in the Seattle, Washington, area rejected a plan for a regional approach to sewage disposal, public transportation, and planning; but then they approved a regional approach to sewage disposal alone, because water pollution was the main crisis area.[73] The voter approval created the Municipality of Metropolitan Seattle which is governed by a Metropolitan Council of 16 members who are elected officials in the 14 member jurisdictions. At present the Municipality of Metropolitan Seattle only has the single function of sewage disposal, but its structure is elastic enough to take on other functions when the voters give their approval.[74]

In 1967 the Minnesota State legislature created a 15-member Metropolitan Council to coordinate the planning and development of the Minneapolis-St. Paul Metropolitan Area.[75] The Council is essentially a State-level rather than a metropolitan-level body. No voter referendum was required for its creation. The Council is appointed by the Governor with the consent of the State Senate. Initially the Council had only planning and review powers, but in 1969 the State legislature created the Metropolitan Sewer Service to provide the Minneapolis-St. Paul Metropolitan Area with wholesale sewerage service.[76] The seven-man Sewer Service Board is appointed by the Council, and the Council is generally responsible for overseeing the operations of the Metropolitan Sewer Service.

The two-tiered form of regional government[77] is the one generally advocated, and it is the approach used for the Municipality of Metropolitan Seattle, the Minneapolis-St. Paul Metropolitan Council, and in its main show place, Toronto, Canada, since 1954.[78] The two-tiered approach calls for sharing governmental functions between the community level and the metropolitan level. The metropolitan government would be large enough to take advantage of economies of scale, implement areawide planning, and provide equities in financing. The community government would be small enough to allow citizen participation in the process of government. The metropolitan government would have primary control over such functions as water supply, sewage disposal, and public transportation; and the community government would have primary control over such things as housing, water distribution, and sewage collection. In regard to the functions primarily controlled by the metropolitan government, the community governments could have some influence through requirements for public hearings, power to delay projects, and in some cases veto power over projects.

The Washington Metropolitan Area is in a situation similar to that of the Seattle, Washington, area in 1957. Pollution of the Potomac has produced much public concern and a crisis in the form of reduced housing starts due to sewer hook-up moratoriums. The voters in the area would probably reject a complete multipurpose regional government, but they are perhaps ready to approve a single-purpose agency for water quality management. The main point to be made here is that the single-purpose water quality management agency should be flexible enough to either fit easily into a future regional government or to take on other functions and be the core of a future regional government, as is the case in Seattle. Long-range alternatives should be kept in mind when formulating shorter term solutions.

A Federal Water and Sewerage Authority

The Federal Government has been supplying water to the District of Columbia since Congress directed the Army Corps of Engineers to provide a public water supply in 1859.[79] The Washington Aqueduct Division of the Corps of Engineers operates intake works, raw water transmission lines, and two filtration plants. Presently the Corps of Engineers provides water to the District of Columbia, Arlington County, Falls Church, and a small part of Fairfax County. It has been recommended by a Board of Engineers that the excess capacity in the facilities be used to meet part of the future needs of Alexandria and Fairfax County.[80]

An area Congressman has proposed that the Federal Government create an authority patterned on the Tennessee Valley Authority (TVA) to operate all the water supply and sewage treatment facilities in the Washington Metropolitan Area.[81] According to the proposal, the Federal authority would acquire the Washington Aqueduct, the D.C. Water Pollution Control Plant, and other major water supply and sewage treatment facilities. The authority would then contract with the District and suburban jurisdictions for the sale of water and sewerage services just as the Washington Aqueduct does today with Arlington County and Falls Church.

If the TVA pattern were followed, the Federal authority would initially be financed by revenue bonds guaranteed by the United States Government. After the authority became firmly established, additional series of revenue bonds would not be guaranteed by the United States. The TVA pattern would also give the authority the right of eminent domain and a three-man board of directors. Directors would be appointed by the President, with the advice and consent of the Senate, for staggered nine-year terms.

Congress clearly has the power to create such an authority. The Supreme Court has given the Commerce Clause of the Constitution an expansive interpretation so that Congress today has wide control over the Nation's waterways. In addition, the Constitution gives Congress the power to legislate for the District of Columbia, and that power could be interpreted to extend to all water withdrawals and wastewater discharges which affect the quantity and/or quality of that reach of the Potomac within the District. In 1859 Congress felt the need for a public water supply in the District of Columbia was great enough to order the Corps of Engineers to provide a water supply. There is now a great need for adequate water pollution control facilities, and Congress could decide to create a Federal authority to provide them.

The main advantage of a Federal authority is that it would have easier access to the large amount of capital funds needed to provide the necessary water quality management facilities to improve the Potomac's quality in the Washington Metropolitan Area. The Federal authority would also have all the advantages of a regional service authority such as unified, continuous planning; ability to take advantage of economies of scale; and the ability to implement a sophisticated water quality management program using a combination of methods. A Federal authority may be easier to bring into being because it would only require Congressional approval rather than approval by the Virginia and Maryland General Assemblies, the District of Columbia Council, and the Congress.

The disadvantages of a Federal water and sewerage authority in the Metropolitan Area are many. Disadvantages it would have in common with a Federal river basin authority are as follows:[82]

> The Federal organization would find reluctant cooperation from State and local governments.
>
> National support for a regional undertaking is slow to form and dissolves quickly.
>
> Without a recognized base, the Federal authority would have difficulty in building regional, political, or administrative support.
>
> The new Federal organization may clash with existing Federal programs in the region.

A major disadvantage is that the Federal authority would not be subject to State regulatory action enforcing water quality standards unless specifically permitted by Federal law, and Congress has been slow to subject Federal agencies to State regulation.

The Federal water and sewerage authority would also be almost totally lacking in political accountability and responsiveness. It would be controlled by a President and Congress elected by the whole Nation, and the relative influence which could be exerted by the authority's customers would be nil. It would take very strong safeguards for the local governments to retain control over the location and development of the water and sewerage facilities which are necessary to residential, institutional, and industrial development. In addition, the Federal authority is structurally incompatible with the existing and possible future scheme of government in the Metropolitan Area. Because of its Federal character it would remain independent of any new local or regional multipurpose service agencies or governments.

The lack of local control over the Federal authority's planning and provision of water supply and sewerage facilities which greatly influence the rate and pattern of an area's development should be considered a fatal weakness. Despite the great need for water pollution control facilities and the capital to finance them in the Washington Metropolitan Area and other metropolitan areas, the local governments should not surrender further control of their development to the Federal Government. The Federal establishment itself should be, and probably is, reluctant to provide water supply and sewerage services on such a local level. The correct approach would be for the Federal Government to continue its recently announced program[83] to encourage areawide and regional approaches to water quality management and to increase its water pollution control appropriations to the already authorized levels.

IV

EXISTING AND ALTERNATIVE INSTITUTIONAL STRUCTURES AT THE RIVER BASIN LEVEL

Existing Institutional Structure

The Potomac River Basin is one of the major river basins in the United States. The Potomac River is 385 miles long and drains 14,670 square miles in four States: West Virginia, Pennsylvania, Maryland, and Virginia, and the District of Columbia. The last 108 miles of the River from the Fall Line just above Washington to Chesapeake Bay are tidal. The Basin has a population of approximately 3.5 million people. There is some municipal, industrial, and acid mine drainage pollution in the upper branches of the Potomac, but most of the River is in fairly good condition above Washington. The main pollutants which the Potomac carries into its Metropolitan Washington reach are silt and nutrients. In the Washington Metropolitan Area the quality of the Potomac goes from fair to very bad, and the area's inefficient, overloaded sewage treatment plants are the major source of pollution in the Potomac River Basin.

The Basin is politically complex, and there are many forms of veto power and assorted regional, professional, and philosophical viewpoints.[84] One weak interstate compact organization has developed from this background, and two other groups have been working hard to surmount the Basin's complexities and arrive at an organization and plan to cope with the Basin's water supply and water quality problems. These organizations are not concerned specifically with the problems of the Washington Metropolitan Area, but their work and jurisdiction does include the Washington Area.

Interstate Commission on the Potomac River Basin

In 1940 Congress authorized Maryland, Virginia, Pennsylvania, West Virginia, and the District of Columbia to enter into a compact providing for the creation of a conservancy district in the Potomac River Basin for "...the purpose of regulating, controlling, preventing, or otherwise rendering unobjectionable and harmless the pollution of the waters of said Potomac drainage area by sewage and industrial and other wastes."[85]

The Interstate Commission on the Potomac River Basin (hereinafter referred to as INCOPOT) consists of three members from each State and three members appointed by the President. The main powers of INCOPOT are set forth in Article II of the compact:

1. collecting water quality data and preparing reports on the condition of streams within the Basin;

2. to cooperate with the legislature and administrative agencies of the signatory bodies and other groups for the purpose of promoting uniform laws, rules, and regulations for the abatement and control of pollution within the Basin;

3. to disseminate water quality information to the public;

4. to cooperate with organizations engaged in wastewater treatment research, and if deemed advisable, to institute and conduct such research; and

5. to recommend reasonable, minimum wastewater treatment standards and water quality standards.

The Commission is financed by appropriations from the signatories and the United States. Until the recent amendments to the compact, the maximum amount which could be contributed by all the signatories combined was $30,000 per year. To fulfill the aims and purposes of the compact, the signatories mutually agreed to faithful cooperation in the abatement of existing pollution and the prevention of future pollution. They also agreed to enact adequate legislation for the abatement and control of such pollution. The compact allows a signatory to withdraw after one years's notice.

INCOPOT has done what it is authorized to do fairly well within its statutory limitations. However, because it is only an advisory body with no power to implement its recommendations, it has not been successful in protecting the Potomac's water quality. The INCOPOT Compact is, unfortunately, typical of many past governmental efforts in the environmental field. The preamble states a noble and commendable purpose, but then inadequate powers are granted to fulfill the purpose.

Congressional action in late 1970 completed what was at least a six-year effort to revise the INCOPOT Compact. The amendments can be found in Section 62.1-65 of the Virginia Code. The amendments broaden the authority of INCOPOT to include water resources and associated land resources, allow INCOPOT to cooperate with and assist public and nonpublic agencies in planning related to water resources and associated land resources, drop the $30,000 per year limit on contributions from the signatories, and provide for the establishment of sections consisting of the Commissioners interested in problems which affect two or more, but not all, of the signatories. These revisions increase the effectiveness of INCOPOT, but they are not enough. The Commission still has no power to implement its recommendations and no independent source of funds, and the signatories still may withdraw after one year's notice if they should object to the Commission's actions. The proposal to allow sections to be formed within the Commission is a very good concept, but it is of limited use because of the need for additional legislation to exercise powers beyond those granted to the Commission and because the activities of the section must be financed through funds provided in advance by the bodies participating in the Section.[86]

Federal Interdepartmental Task Force on the Potomac River Basin

In 1963 the U.S. Army Corps of Engineers presented the results of a six-year study of the Potomac River Basin's water resources.[87] The Corps of Engineers' recommendation of 16 major multipurpose reservoirs aroused considerable local, State, and Congressional opposition.[88] Because of that opposition, President Johnson asked the Secretary of the Interior for a Potomac conservation plan in 1965, and the Secretary created the Federal Interdepartmental Task Force on the Potomac River Basin to formulate a conservation plan for the Basin.[89]

The Task Force is composed of representatives of the Department of Interior; Army; Agriculture; and Health, Education, and Welfare. In 1968 the Task Force published The Nation's River which contained the results of its initial work. The Task Force made major contributions through its recommendations for a new Federal-interstate compact organization and the reconvening of the Potomac Enforcement Conference. The Task Force has not been active in recent years.

Potomac River Basin Advisory Committee

The Potomac River Basin Advisory Committee is an official *ad hoc* group representing the Governors of the Basin States and the Mayor-Commissioner of the District of Columbia. The Committee was organized in 1965 to coordinate the interests of the Basin jurisdictions and to work with the Federal Interdepartmental Task Force on the Potomac River Basin. The Committee consists of three representatives from each of the Basin jurisdictions. The Committee was responsible for the drafting of the proposed Potomac River Basin Compact and is now working for its acceptance. The proposed Potomac River Basin Compact is a well written document, and the Commission it provides for is needed to provide for the coordinated planning, development, and administration of the water and related natural resources of the Potomac River Basin.

Alternative Institutions Within Existing Laws

The existing Potomac River Basin organizations are making full use of the existing legislation, and there are no reasonable alternatives within the existing legal framework of the basin jurisdictions. It is clear that legislative changes are needed.

Alternative Institutions Requiring Legislative Changes: The Potomac River Basin Compact

The already proposed Potomac River Basin Compact will be the only alternative discussed, because it has already been introduced by the Potomac River Basin Advisory Committee; and this author concurs with the Committee's assessment of the Compact as the best available institutional device to provide for the planning, development, and administration of the water and related natural resources of the Basin.

The Virginia version of the Compact[90] will be discussed here. The Compact has been enacted by Virginia and is under legislative consideration in the other Basin States. Virginia, Maryland, West Virginia, Pennsylvania, the District of Columbia, and Congress must all approve it in identical form before the Compact can take effect. The Virginia version differs from the proposed Compact in at least two respects. One change is that the Commission's jurisdiction does not extend to ground water. The other change, in the controversial "Amenities Section" of Article 9 of the Compact, prohibits the Commission from using its limited zoning power until 1980; thus giving the local jurisdictions more than enough time to enact their own zoning regulations, and thus prevent the imposition of zoning regulations by the Commission. The Commission's zoning powers can only be exercised in river zones, and they may not extend inland more than one mile without the concurrence of the local governing body. The purpose of the river zones is to preserve and promote the aesthetic and other values inherent in the historic, scenic, and environmental amenities of the Potomac Basin. The protection of the Potomac's shoreline is, of course, a major issue in the Washington Metropolitan Area.

The Compact is to have a 100-year life with automatic renewal unless one or more of the Signatory States notifies the Commission of its intention to withdraw 7 to 12 years prior to the end of the 100-year period. The United States may withdraw at any time, and, if it does withdraw, the States may repeal the Compact between 7 and 12 years after the withdrawal. The Potomac River Basin Commission is to consist of the Governor of each Signatory State (the District of Columbia is considered a State for purposes of the Compact) or an appointee to serve at his pleasure and a Federal member appointed by the President. Each Commissioner shall have one vote, with a vote of four needed for action unless otherwise provided in the Compact. The Compact is a very complete document, and the Commission is granted powers which can have a great effect on water supply and water quality management in the Washington Metropolitan Area.

It is the stated policy of the Compact that to the greatest extent consistent with the purposes of the Compact, the existing governmental offices and agencies should be used to carry out the Commission's comprehensive water resources plan. However, if the Commission finds that an agency fails, refuses, or is unable to act, the Commission, after a hearing upon due notice, could itself perform the necessary functions. To perform these functions, the Commission has the power to acquire, hold, administer, and maintain real and personal property and the right of eminent domain. The Commission may also make charges for the use of its facilities without regulation by any other governmental agency or signatory. The Commission also has review and veto power over all projects affecting water resources in the Basin.

In the area of water supply, the Commission has the power to provide for storage, treatment, pumping, and transmission facilities; but it is prohibited from providing retail distribution of water. Thus, the Commission could, if desired, become a wholesale supplier of raw or treated water throughout the whole Basin or just within the Washington Metropolitan Area.

The Compact assigns primary responsibility for water quality management and control to the States, and the Commission is to act in a coordinating role. However, the Commission may acquire, construct, operate, and maintain facilities and equipment as it may deem appropriate for the management and control of the quality of any waters in the Basin. Thus, in addition to supplying wholesale treated water to the Washington Metropolitan Area, the Commission could also provide wholesale wastewater treatment services and other methods of water quality management such as instream reaeration.

The Commission also has power to provide for flood protection, watershed management, recreational, and hydroelectric projects. Subject to the constitutions and laws of the Signatories, governmental agencies and local governments are authorized to contract with the Commission, each other, and other persons to provide projects to carry out the Commission's comprehensive water plan, amenities plan, or for the development of park and historic areas, or for the collection and disposal of solid wastes, or to control, abate, and prevent air pollution.

To finance its projects or to assist with the financing of the projects of other governmental units for which it might assume some fiscal obligation, the Commission may borrow money and issue revenue bonds. The Commission may not pledge the credit of any Signatory for repayment of interest and principal on the bonds. If funds from the Commission's bonds issues and revenues are not sufficient to meet the capital budget and the current expense budget, the additional funds needed shall be apportioned among the Signatories by unanimous vote of the entire Commission. The cost of specific projects may be defrayed by making special assessments upon benefited owners, including governments, in accordance with the applicable State laws.

All of the official actions of the Commission must be taken in public session, and the Commission's orders and actions are subject to judicial review in any State or Federal court of competent jurisdiction.

The acceptance of the Potomac River Basin Compact will abolish the Interstate Commission on the Potomac River Basin, and its personnel would be transferred to the Potomac River Basin Commission.

The major disadvantages of having the Potomac River Basin Commission provide wholesale water and sewerage services to the Metropolitan Area are that there is no direct local control over the Commission; and the Commissioners representing West Virginia, Pennsylvania, and the Federal Government could influence the Commission's activities in the Metropolitan Area. This latter problem could, perhaps, be solved by amending the Compact to provide for "Sections" similar to those provided for in the amendments to the INCOPOT Compact. However, even with a "Section" arrangement, the provision of wholesale water and sewerage services by the Commission would have all the disadvantages of the State-level compact which was discussed at page 46 supra.

Whether or not the Potomac River Basin Commission might be called upon to provide the Washington Metropolitan Area with wholesale water and sewerage services, the Commission, with its comprehensive basinwide purposes, is still required. Any Metropolitan Area water and sewerage agency would have to coordinate its activities with the Commission's basinwide efforts to provide a dependable water supply and to enhance the quality of the Nation's River.

V

EXISTING AND ALTERNATIVE INSTITUTIONAL ARRANGEMENTS IN NORTHERN VIRGINIA

Existing Arrangements

The Virginia portion of the Washington Metropolitan Area includes Arlington, Fairfax, Loudoun, and Prince William Counties and the independent Cities of Alexandria, Fairfax, and Falls Church. Water supply and sewerage services are provided by the general governmental units, water and sewer authorities, sanitary districts, private water companies, and Federal agencies. Other organizations influencing area water supply and water quality management decisions include the Northern Virginia Planning District Commission, the Northern Virginia Soil and Water Conservation District, the Virginia State Water Control Board, the Virginia Department of Health, the Water Quality Office of the Environmental Protection Agency, and other Federal agencies.

General Governmental Units

Title 15.1 of the Virginia Code provides for the organization and powers of counties, cities, and towns. The governing body of every county, city, and town is authorized to acquire, establish, maintain, and operate water works and other public utilities or to contract for such services.[91] Any two or more political subdivisions may enter into such contracts as they may deem proper for the acquisition, construction, maintenance, or operation of any public works projects.[92] The power to establish and operate sewage disposal systems is subject to the approval of the Virginia State Water Control Board (VSWCB).[93]

The establishment or extension of a sewerage system[94] or water supply system[95] to serve three or more connections must be approved by the county in which the system is located. Counties also have the power to regulate the installation of septic tanks.[96]

Cities and towns may regulate and inspect public and private water supply systems, sewerage systems, and septic tanks.[97] They also have specific powers to provide and operate water supply and sewerage systems or to contract with others for the provision of such services.[98]

Counties, cities, and towns may finance the establishment, extension, or improvement of water supply and sewerage systems by issuing revenue bonds or general obligation bonds.[99] However, Article VII, Section 10, of the new Virginia Constitution requires an election before a county may issue any general obligation bonds in the public market. Cities and towns may issue any bonds up to 18 percent of assessed real estate valuation without an election, and above that amount if the voters approve bonds for a revenue-producing project.

In Northern Virginia two counties, two cities, and 12 towns provide water supply and/or sewerage service.

Arlington County - The County Utilities Department provides Arlington with water and sewer services. Finished water is purchased from the District of Columbia water system. The County operates a 24 mgd activated sludge sewage treatment plant which also receives some waste water from Fairfax, Alexandria, and Falls Church. Sewage from the northwest corner of the County flows into the District of Columbia sewer system and is treated at the District of Columbia Water Pollution Control Plant (Blue Plains).

Fairfax County - The County provides sewerage service through its Department of Public Works. The County has four main sewage treatment plants; the 18 mgd Lower Potomac Plant, the 8 mgd Westgate Plant, the 2.5 mgd Little Hunting Creek Plant, and the 2.0 mgd Dogue Creek Plant. The Lower Potomac Plant is to go into operation in the fall of 1970. Recently announced plans call for the closing of the Westgate, Little Hunting Creek, and Dogue Creek sewage treatment plants. The flows presently going to those plants will be divided between an expanded Lower Potomac Plant and a new Alexandria Sanitation Authority treatment plant.[100] The County also operates five small sewage treatment plants in the Occoquan Creek Watershed. Additional sewage is sent to treatment plants outside the County. Approximately 10 mgd of sewage goes to the Alexandria Sanitation Authority plant, 1.5 mgd flows to the Arlington County plant, and about 4 mgd goes to the District of Columbia from the northwest portion of the County.

City of Fairfax - Water and sewerage service is provided by the City's Department of Public Works. The City operates a reservoir and filtration plant on Goose Creek in Loudon County. From this facility it supplies water to its residents, the Town of Herndon, the Loudoun County Sanitation Authority, and areas of Fairfax County adjacent to the City.

The City operates a 2 mgd secondary sewage treatment plant on Accotink Creek, but plans to abandon it and use Fairfax County's Lower Potomac Plant as soon as a contract can be negotiated.

City of Falls Church - The City Department of Public Utilities provides water and sewerage services but does not operate any water or sewage treatment facilities. The City buys finished water from the District of Columbia. Part of the City's sewage is treated at the Arlington County sewage treatment plant, and the remainder flows through the Fairfax County sewerage system and into the Alexandria Sanitation Authority's treatment plant.

Town of Vienna - This Town is in Fairfax County, and it obtains its water from Falls Church (which buys it from the District of Columbia) and from wells. Part of the Town's sewage flows into the Potomac Interceptor and thence to the District of Columbia Water Pollution Control Plant. The remaining sewage flows into the Accotink Interceptor and thence to Fairfax County's Lower Potomac Plant.

Town of Herndon - This Town in western Fairfax County purchases finished water for distribution and resale from the City of Fairfax's Goose Creek system. Sewage from the north portion of the Town flows into the District of Columbia sewerage system through the Potomac Interceptor. The remainder of the Town is served by a small trickling filter plant.

Towns in Loudoun County - The Towns of Leesburg, Purcellville, Middleburg, Round Hill, Hillsboro, Hamilton, and Lovettsville in Loudoun County all have small water systems drawing from wells or reservoirs. The Towns of Leesburg, Middleburg, Purcellville, Hamilton, and Lovettsville also have small secondary sewage treatment plants which discharge into the Goose Creek Watershed.

Towns in Prince William County - The Towns of Manassas and Manassas Park presently obtain their water supply from wells. However, Manassas is constructing a reservoir and filtration plant on Broad Run, and it should be in operation by the end of 1970. Manassas and Manassas Park each operate two secondary treatment plants which discharge into the Occoquan Watershed. The Town of Quantico uses the water supply and sewerage systems on the Quantico Marine Base.

Water and Sewer Authorities

The Virginia Water and Sewer Authorities Act[101] authorizes the governing body or bodies of one or more political subdivisions to create by ordinance or resolution a water authority, a sewer authority, a sewage disposal authority, or a garbage and refuse collection and disposal authority, or any combination of these services under the title of an authority. Passage of the ordinance must be followed by a notice of hearing and a public hearing in each participating political subdivision. A referendum is required in a participating political subdivision if the governing body calls for one or if ten percent of the qualified voters in the subdivision file a petition with the governing body at the hearing calling for a referencum. The participating political subdivisions must file articles of incorporation with the State Corporation Commission; and if the Commission finds that the political subdivisions have conformed to the law and the result of the referendum, if any, was favorable, the Commission shall then issue a charter, and the authority comes into being.

Any political subdivision may join or withdraw from an existing authority, but no political subdivision may withdraw after the authority has incurred any obligation. The procedures for joinder or withdrawal are similar to those for creation of an authority, except that there is no requirement for a hearing and no provisions for a referendum.

Each authority is governed by a board of five members, or not less than one member from each participating political subdivision, selected in the manner provided for in the ordinances creating the authority. An authority may acquire, construct, extend, operate, and maintain any water system, sewer system, sewage disposal system, or garbage and refuse collection and disposal system. Authorities also have the power to enter into contracts with the Federal Government, the Commonwealth of Virginia and any of its agencies or instrumentalities, or with any unit, private corporation, association, or individual for the furnishing of water and sewage services to them or the provision of such services by them. Contracts may also be made with political subdivisions, corporations, and individuals of Virginia or any adjoining State for the joint construction and operation of any project which is partly in Virginia and partly in the adjoining State. All counties, municipalities, and other public bodies are authorized to make conveyances to and contracts with any authority. Each authority is subject in all respects to the jurisdiction of the VSWCB.

Authorities may finance their projects by the issuing of revenue bonds. There is no requirement for a bond referendum, and such revenue bonds are not debts of the Commonwealth or of any participating political subdivision. The Virginia portion of the Washington Metropolitan Area has three authorities created under the Virginia Water and Sewer Authorities Act.

Fairfax County Water Authority - The Fairfax County Water Authority was created by the Fairfax County Board of Supervisors in 1957 for the purpose of acquiring, constructing, operating, and maintaining an integrated water system for supplying and distributing water in Fairfax County. In 1959 the Authority's charter was amended to allow the Authority to acquire, construct, operate, and maintain water systems, sewer systems, and sewage disposal systems in Fairfax County or partly within and partly without the County. The Authority board consists of five members appointed by the County Board of Supervisors for staggered three-year terms.

Despite the amendment to its charter, the Authority does not operate any sewerage facilities. It is, however, the major supplier of water in Northern Virginia. In 1968 approximately 455,000 people used water supplied by the Authority.[102] The Authority's wholesale customers include the Alexandria Water Company, Dulles International Airport, Fort Belvoir, the Occoquan-Woodbridge Sanitary District, the Dumfries-Triangle Sanitary District, and the Colchester Public Service Corporation. In addition, the District of Columbia Department of Corrections at Lorton buys raw water from the Authority. Most of the Authority's water is taken from its Occoquan Creek Reservoir, but supplementary sources of water include wells and purchases from the Cities of Fairfax (Goose Creek system) and Falls Church (District of Columbia system).

Alexandria Sanitation Authority - The City of Alexandria created the Alexandria Sanitation Authority in 1952 for the purpose of developing a water pollution abatement program. The Authority is governed by a five-member board appointed by the Alexandria City Council for staggered terms of four years each.

At present the Authority operates an 18 mgd capacity trickling filter plant which receives sewage from Falls Church and areas of Fairfax County in addition to the sewage from Alexandria. Plans call for expansion of the plant to at least 36 mgd and a change to the activated sludge process by mid-1972. At that time the Authority will also be serving a large area of Fairfax County.

Loudoun County Sanitation Authority - The Loudoun County Sanitation Authority was created in 1959 for the purpose of providing water and sewerage facilities to serve the needs of the entire County. At present its activities are concentrated in the developing eastern part of the County in the area of Dulles International Airport.

The Authority purchases its water from the Goose Creek system of the City of Fairfax. The sewage from the Authority's present service area goes into the Potomac Interceptor and thence into the District of Columbia Water Pollution Control Plant. Because most of eastern Loudoun County is in the Potomac Interceptor drainage area, and the design capacity is for the projected population in 2000, the Authority does not need to be considering any major sewage treatment facilities for the near future.

Sanitary Districts

Chapter 2, Title 21, of the Virginia Code provides for the creation of sanitary districts upon the petition of at least 50 qualified voters to the circuit court and a court hearing and determination that the property in the proposed district will be benefited. A sanitary district cannot include the area of more than a single county. The districts are enlarged or abolished in the same manner as they are created, and two or more sanitary districts within a county may be merged by order of the circuit court. However, if a county has adopted the urban county form of government, as Fairfax County has, the County Board of Supervisors assumes the powers of the circuit court as to creating, enlarging, abolishing, or merging sanitary districts.[103]

Sanitary districts are supervised by the county governing body, and, in addition to water supply and sewerage services, they may provide garbage collection and disposal, parking lots, street lights, sidewalks, community buildings and recreational facilities, and fire-fighting systems. The district governing body may construct, operate, and maintain the facilities necessary for providing services or contract for the provision of the services. The district may also serve areas outside its boundaries under contract.

Besides imposing the normal service charges and connection fees, the district may levy a tax on property within the district, if necessary. The sanitary district can issue bonds, but a referendum must be ordered by the circuit court if a majority of the county governing body asks for one or if at least 50 qualified voters petition the court for one. There are six sanitary districts in the Virginia portion of the Washington Metropolitan Area, and all six are located in Prince William County.

Occoquan-Woodbridge Sanitary District - The District provides water and sewerage services to approximately 29,000 people. Water is purchased from the Fairfax County Water Authority, and sewage is treated in four secondary sewage treatment plants with a combined capacity of 2.4 mgd. None of the treatment plants are tributary to the Occoquan Reservoir.

Dumfries-Triangle Sanitary District - The District purchases finished water from the Fairfax County Water Authority and operates a small sewage treatment plant.

Greater Manassas Sanitary District - At present wells are used to supply water to the approximately 9,000 people in the District, and surface supplies are being investigated to meet future demands. The District provides sewage treatment with a 1 mgd plant which discharges into Bull Run, a tributary of Occoquan Creek.

Yorkshire Sanitary District - The District uses wells to provide an estimated 3,400 residents with water. No sewerage facilities are provided.

Gainesville-Haymarket Sanitary District - At present neither water nor sewage treatment is provided by the District. There is a small sewer collection system, and the waste from this system is hauled to the Greater Manassas Sanitary District plant for treatment and disposal. Plans call for a well-water system and an expanded sewerage system including a treatment plant. The plant, if built, would be in the Occoquan Watershed.

Nokesville Sanitary District - This recently formed District does not provide water service and only operates a very small sewage treatment plant.

Private Water and Sewerage Companies

In the Virginia Code, the term "public utility" includes those companies providing water or sewerage facilities either directly or indirectly to the public.[104] Companies furnishing water or sewerage facilities to more than 50 customers cannot provide service without a certificate of public convenience and necessity from the State Corporation Commission.[105] The application for the certificate must include detailed plans of the facilities and a statement of qualifications to engage in such activities.

The companies are charged with the duty of providing adequate service at reasonable rates.[106] The State Corporation Commission may set rates if the companies' rates are found unreasonable, insufficient, or unjustly discriminatory.[107] The State Corporation Commission may also order an increase in the level of water or sewerage service.[108]

There are two regionally significant private water companies in Northern Virginia and one regionally significant private company providing sewerage facilities.

Alexandria Water Company - The Company purchases finished water from Fairfax County Water Authority for distribution in the City of Alexandria. The Company is a subsidiary of the American Water Works Company. It began operations in 1852 and was the owner and operator of the Occoquan Creek Reservoir, the filtration plant, and distribution facilities in a large part of Fairfax County until 1967. The Reservoir, filtration plant, and Fairfax County facilities were obtained for the Fairfax County Water Authority in a condemnation suit by the Fairfax County Board of Supervisors.[109]

Prince William Water Company - The Company is a subsidiary of the Alexandria Water Company and provides the Dale City Area of Prince William County with finished water purchased from the Alexandria Water Company. Prince William County is considering taking over the Company's property by negotiated purchase or condemnation.[110]

Dale Service Corporation - This Company operates two 2 mgd sewage treatment plants in the Dale City Area of Prince William County.

Northern Virginia Planning District Commission

The Virginia Area Development Act[111] was enacted to encourage effective regional planning, to provide for the creation of a unit of government capable of performing governmental functions and services on a regional basis, and to deter the fragmentation of governmental units and services. The Planning District is the first step toward reaching the limited regional form of government provided for in the Act. The second, and far more difficult, step is the actual creation of the regional unit of government, the service district.

The boundaries of the Northern Virginia Planning District were established by the Division of State Planning and Community Affairs, as provided in the Virginia Code.[112] The District is made up of the Virginia portion of the Washington SMSA and thus coincides with the area of Virginia covered by this paper. A planning district commission comes into being when the governing bodies of the political subdivisions embracing the majority of the population within the district ratify a charter agreement. Those governmental subdivisions not a party to the charter agreement remain in the planning district but cannot be represented on the planning district commission. This is now the position of Loudoun County. It is in the Northern Virginia Planning District, but it is not represented on the Planning District Commission. The major functions of the Planning District Commission are the preparation of a comprehensive plan for guiding the development of the District, the review of applications for State or Federal aid by local governing bodies, and the preparation and promulgation of a plan for the creation of a service district when needed or when requested by two or more member governing bodies. All of the above powers have a direct and significant effect on the provision of water and sewerage services by organizations within the District.

The Northern Virginia Planning District Commission is playing a key role in coordinating the search for a solution to the water quality problems in the Occoquan Watershed, but it appears to be reluctant to take on a leadership role. The Commission also appears reluctant to begin serious consideration of a service district for the provision of water, sewerage, or other services on a regional basis in Northern Virginia.

Northern Virginia Soil and Water Conservation District

"Silt is the greatest single pollutant discharged into the Potomac."[113] About 29 percent of it enters the Potomac from Arlington and Fairfax Counties in Virginia, Prince Georges and Montgomery Counties in Maryland, and the District of Columbia.[114] This problem has been recognized by the Enforcement Conference Conferees, and their Recommendation 12 calls for surveillance of sediment control programs.

The Northern Virginia Soil and Water Conservation District consists of Fairfax, Loudoun, and Prince William Counties. The District was formed under the Soil Conservation District's Law.[115] In its 1970 session, the General Assembly recognized the problems of soil erosion in urban as well as rural areas and amended the Law to include nonagricultural phases of soil and water conservation on a par with the agricultural phases.

The District is governed by a Board of Directors composed of two elected members from each County and two members appointed by the Virginia Soil and Water Conservation Commission. The Commission also has the power to relocate the boundaries of the District. The program of the District consists mainly of providing information and consultative services to assist landowners in the development and use of land with a minimum of adverse effects on the natural resources of the District. Emphasis is placed on improving soil conservation practices. The District also cooperates with other agencies in programs to protect the natural resources of the District.

The Soil Conservation District's Law has provisions for strong land use regulations to promote soil and water conservation, but such regulations must be approved by at least two-thirds of the votes cast in a referendum on the regulations. Watershed Improvement Districts are also provided for; but the referendum requirements are even stricter, since only landowners can vote, and at least two-thirds of the votes cast must be in favor of establishing the District.

State Influence

In the Federal Water Pollution Control Act, as amended, it is the declared policy of Congress "... to recognize, preserve, and protect the primary responsibilities and rights of the States in preventing and controlling water...."[116] Thus, the State of Virginia has the most control over water quality management activities in Northern Virginia and the principal State agency for exercising that control is the VSWCB. In addition, the State Department of Health has considerable control over the provision of water supply and sewage treatment facilities, and the State Division of Planning and Community Affairs and the Virginia Soil and Water Conservation Commission play lesser roles in influencing water quality management activities.

Virginia State Water Control Board - Although created in 1948, the Virginia State Water Control Board did not assume a strong role in protecting the quality of State waters until the latter part of the 1960's. Despite numerous invitations, the Board did not send a representative to the first session of the Conference on Pollution of the Potomac River in the Washington Metropolitan Area. That first session was held in 1957. Fortunately, the Board's attitude has been changing; and it was represented at the second session in 1958, and it was well represented in the continuing third session which was convened in April 1969.

In the Northern Virginia Area the Board has limited the quantity of waste water discharged either directly or indirectly into Occoquan Creek and is requiring nutrient removal processes at all new treatment facilities within the Watershed.[117] On June 3, 1970, the Board issued a subsequently modified order prohibiting any new connections to sewers leading to three overloaded sewage treatment plants in Fairfax County.[118] Even with the modification allowing connections if the owner had obtained a building permit prior to June 4 and the dubious way in which the modification was made,[119] the connection ban was a forceful measure and indicated a growing activist attitude. The Board will probably be even more active in the future with the recent appointment of four new members, three of whom are conservation-oriented.[120] Four members could be appointed because the new State Water Control Law[121] expanded the Board from five to seven members, and the terms of two previous members expired on July 1, 1970.

The new Water Control Law also gave the enlarged Board increased powers and declared that it was the policy of the Commonwealth to protect existing high quality waters. Some of the most important powers and duties of the Virginia State Water Control Board are as follows:[122]

1. The power to establish water quality standards.

2. The power to issue, revoke, or amend certificates for waste discharges.

3. The power to issue special orders such as those limiting discharges to Occoquan Creek and prohibiting new sewer connections in areas of Fairfax County.

4. The power to administer programs of financial assistance for the planning and construction of water quality control facilities for political subdivisions.

5. The power to establish policies for effective areawide or basinwide water quality management and to ensure that new waste treatment facilities are in accordance with those policies.

6. The power to establish wastewater treatment requirements.

Using its power to establish policies for effective areawide or basinwide water quality management and its authority to ensure that new waste treatment facilities are in accordance with areawide or basinwide policies, the Board had a basinwide plan developed for the Occoquan Watershed,[123] and is trying to ensure compliance with the plan, including the formation of a regional agency to implement the plan. The Board is using a potent "carrot and stick" approach. The "carrot" is the offer of Federal and State financial assistance for a basinwide approach, and the "stick" is its refusal to lift its restriction on the quantity of waste water discharged into the watershed or to issue a certificate for the construction of facilities not in accordance with a basinwide plan. Such a certificate from the Board is necessary before any sewerage system or sewage treatment works can be built. The Board's interest in seeing the adoption of a basinwide plan for the Occoquan Watershed is commendable, and hopefully, the Board will push for regional approaches to water quality control and management in other areas. The only caveat is that, in this particular instance, the plan for the Occoquan Watershed and the agency to implement it should, perhaps, have been developed with an even larger area in mind.

State Department of Health - The State Water Control Law provides that all sewerage systems and sewage treatment works shall be under the joint supervision of the State Department of Health and the Virginia State Water Control Board.[124] The Department of Health is to advise, upon request, any owner having or intending to install sewage treatment facilities; to receive information concerning treatment plant operating results when requested by the Board; and to receive, review, and approve or disapprove plans for sewerage systems or treatment facilities designed to serve more than 400 persons.

The State Board of Health has general supervision and control over all water supplies and water works in the State as to their sanitary and physical quality for drinking or domestic purposes.[125] A permit from the Board of Health is needed to construct or operate any water supply or water works for domestic purposes.[126]

Division of State Planning and Community Affairs - The Division may indirectly influence water quality management in Northern Virginia through its influence in the Northern Virginia Planning District Commission. It is to provide professional and technical assistance to any planning district commission engaged in the preparation of a service district plan.[127] The Division is also to make appropriate reports and recommendations in regard to a service district plan prior to its approval or disapproval by the governing bodies of the involved political subdivisions.[128] Boundaries of planning districts may be adjusted as the Division deems advisable.[129] This is an important power because a service district cannot be expanded beyond the boundaries of a planning district.[130]

Virginia Soil and Water Conservation Commission - The Commission can influence soil and water conservation programs in the Virginia portion of the Washington Area through its relationship to the Northern Virginia Soil and Water Conservation District. The Commission can assist, advise, and inform the districts in their programs. However, the Commission's most influential power is the ability to create new districts and relocate the boundaries of existing ones.[131]

Federal Influence

The many ways in which the Federal Government influences water quality management decisions in Northern Virginia and the remainder of the Metropolitan Area were discussed beginning at page 16 *supra*.

Institutional Problems in Northern Virginia

Northern Virginia has the most fragmented water quality management arrangement in the Washington Metropolitan Area. One county, two cities, 12 towns, two authorities, four sanitary districts, and two private companies provide water supply services. Sewerage services are provided by two counties, two cities, eight towns, two authorities, and five sanitary districts. In all there are 25 different governmental units and two private companies providing water and/or sewer services. Of the 25 governmental units, 16 are general purpose units, and nine are special district units.

The fragmentation noted above results in expensive duplication of services and facilities, uneconomical operating levels, insufficient planning, and coordination problems. The Virginia Metropolitan Areas Study Commission found: "When area-wide planning should take place.

piecemeal development is the rule."[132] The Commission also concluded that "...much of the area-wide policymaking that does take place...is expedient and along the lines of only the most obvious or politically pressing necessities."[133] Fragmentation and the resulting lack of coordinated planning and uneconomical operating levels are some of the major underlying factors which have necessitated the plans to abandon four sewage treatment plants[134] in an area with a rapidly growing population. Making use of economies of scale through larger and regional treatment plants is especially important as treatment requirements are being increased. Tertiary treatment and nutrient facilities have much higher construction, maintenance, and operating costs than the secondary treatment facilities presently in use.

Governmental fragmentation, uncoordinated planning, and a lack of money due to a low priority for water quality at all levels of government have caused two major problems in the Virginia portion of the Washington Metropolitan Area. The problems are an on-and-off building moratorium in an area where homebuilding is a major industry[135] and a deterioration in the quality of the major source of water[136] in an area which has a water quantity problem.

On-and-Off Building Moratorium - On June 3, 1970, the Virginia State Water Control Board ordered a moratorium on sewer connections in the central and eastern portions of Fairfax County served by three overloaded sewage treatment plants.[137] The ban was subsequently modified to allow homes to be connected if the building permit for them had been issued before June 4, 1970.[138] Even with the modification, many developers were opposed to the ban, and they filed suit against the Virginia State Water Control Board and Fairfax County Board of Supervisors asking that the ban be set aside or further modified.[139] On July 28, 1970, a Fairfax County Circuit Court judge lifted the sewer connection ban but at the same time ordered the County to make four million dollars worth of improvements to the three overloaded treatment plants as quickly as possible.[140] The Water Control Board has since notified Fairfax County that the four million dollar improvement program will not be sufficient to allow additional sewer connections, and a further expansion in capacity is required.[141]

Development in the Occoquan Watershed portions of Fairfax, Loudoun, Prince William, and Fauquier Counties has also been limited by the Water Control Board. The Board has limited the quantity of waste water discharged either directly or indirectly into Occoquan Creek.[142]

The Chairman of the Fairfax County Board of Supervisors has admitted that the County's overloaded sewage treatment plants are the result of "not taking the necessary steps to keep pace with the population increase."[143] "Growth has not been controlled as it should have been," he said.[144] One reason growth hasn't been controlled is that homebuilding is an important industry in Northern Virginia. Its importance and power has been evident in the continuing sewer ban controversy.[145] Several area residents have publicly charged that the developers' interests have been put ahead of the interest of the people.[146]

The economic losses due to the on-and-off sewer ban have not been estimated, but the potential for economic loss is large. If the original ban had lasted 12 months, it is estimated that Fairfax County would have suffered a direct loss of $105 million in residential construction expenditures and a total economic loss of two to two and one-half times the direct loss.[147] Such losses would greatly exceed the $76 million Fairfax County plans to spend to correct the existing sewage treatment deficiencies and to provide for future treatment.[148]

In addition to economic losses from water pollution in Northern Virginia, recreational losses have occurred. Lake Accotink in Fairfax County had to be closed to all fishing and water contact activities because of pollution from Fairfax City's overloaded sewage treatment plant.[149] The area's main source of water has also been affected.

Occoquan Watershed Problems - Occoquan Reservoir, a 9.8 billion gallon impoundment located on the lower reaches of Occoquan Creek, has a drainage area of approximately 570 square miles and is estimated to have a safe yield of 65 mgd. The Reservoir is owned and operated by the Fairfax County Water Authority and is the major water supply source for the Virginia portion of the Washington Metropolitan Area. This major water supply source is seriously threatened by the increasing volume of waste water being discharged within the Watershed.[150]

Any solution to the problems of the Occoquan Watershed are complicated by the inclusion of parts of four Counties, Fairfax, Loudoun, Prince William, and Fauquier, within the Watershed. Solutions are further complicated by the fact that Fauquier County is not part of the Washington SMSA, the Northern Virginia Planning District, or the Metropolitan Washington Council of Governments. At least six different governmental units rely on the Watershed as a source of water, and at least six other governmental units discharge waste water into the Watershed. Thus, the need for some type of basinwide approach is apparent.

The Virginia State Water Control Board is trying to ensure that a basinwide sewage plan is adopted and implemented. However, the jurisdictions involved are not enthusiastic and have not yet agreed on an administrative organization to build and operate a basinwide system. The jurisdictions are only moving toward a regional system because the Water Control Board won't release Federal and State funds for a sewage treatment plant unless it is part of a regional system. The jurisdictions are prevented from building treatment facilities with their own funds because a Water Control Board permit is necessary for such construction.

Despite the reluctance of the involved jurisdictions to adopt a basinwide sewerage agency for the Occoquan Watershed, there should be planning and discussion of even stronger and more comprehensive water quality management alternatives in the Virginia portion of the Washington Metropolitan Area, if an areawide agency is not created.

Alternative Institutions Within Existing Law

The study could not consider every possible alternative organizational arrangement for improving the present water quality management structure in Northern Virginia. It has, however, considered those alternatives which appear to have some chance of political acceptance while still having enough strength and flexibility to be an effective water quality management organization. "The best chance of political acceptance..." does not mean a good or even fair chance of acceptance in today's political climate. But because of an increased concern for the environment, an on-and-off building moratorium, and an endangered water supply, the political climate in regard to regional water supply and water quality management organizations is improving rapidly.

The emphasis here is on strong operating agencies. A purely cooperative arrangement is not considered to be an effective alternative, because of its voluntary nature. One urban planner has noted that political officials who speak as if "cooperation" is the panacea for many problems do not want to develop concrete regional "cooperative" programs.[151]

Service District - The most effective and politically responsive organization for water quality management in Northern Virginia would be the service district provided for in Article 3 of the Virginia Area Development Act.[152] Creation of a service district requires several distinct steps. First, the Northern Virginia Planning District Commission, under its own initiative or at the request of two or more political subdivisions, must prepare and promulgate a service district plan embracing all the governmental subdivisions party to the Commission charter. The plan must then be approved by the governing body of each governmental subdivision in the proposed service district and the majority of the voters in each governmental subdivision.

Once created, the service district would be a new governmental jurisdiction with districtwide powers. The Act requires that the initial service district plan:

> shall assume that the services to be initially provided by the service district shall be of sufficient number and importance to produce a meaningful governmental unit and program and shall provide the framework of government for the eventual performance by the service district of all of the functions and services which are appropriate for performance on a districtwide basis.[153]

Water supply and sewage treatment would be ideal services to be performed by a Northern Virginia Service District. Responsibility for providing rapid transit service has already been given to the Northern Virginia Transportation Commission.[154]

The service district plan would set forth the exact manner of the district's financing, but the district is authorized to issue revenue bonds without a referendum. The bonds would not be a debt of the State or any political subdivision other than the district.

The best arrangement would be for the service district to provide wholesale water supply and sewage treatment service to the existing general-purpose governments. Thus, the district would own and operate water supply reservoirs, water treatment plants, major water transmission mains, sewer interceptors, and sewage treatment plants. The general-purpose governments would bill retail customers and own and operate the local water distribution and sewage collection systems.

This service district plan would, of course, arouse much opposition. Some would argue that the people would be losing control over the water and sewage services which are so vital to a community's growth. This is not so, because the service district must be governed by a commission, at least a majority of which shall be elected from single member election districts, and the remainder must be members of the governing bodies of the governmental subdivisions within the districts. Thus, every resident would be represented by a directly elected member on the service district commission. Under the existing arrangement, none of the members of a water and/or sewer authority board are directly elected, and the Prince William County Board of Supervisors is the ex officio governing body of the County's six sanitary districts. Residents of Alexandria must rely on the State Corporation Commission to ensure that they receive adequate water service.

Another opposition argument would be that the service district is just another level of government and increases the governmental fragmentation which already has the citizen confused. However, the above service district plan would actually reduce fragmentation. The plan would eliminate the Fairfax County Water Authority, the Alexandria Sanitation Authority, the Loudoun County Sanitation Authority, and the six sanitary districts in Prince William County. Thus, nine governmental units would be replaced by one. Future governmental fragmentation would be reduced because the service district is a multipurpose organization and would eliminate the need for any new special district units in Northern Virginia. Other services which the service district could provide on a districtwide basis range from air quality management to park acquisition and maintenance to welfare programs.

Although the service district would eliminate the Fairfax County Water Authority and eight other special district governments, they would be eliminated only as separate units, and their property and personnel would be absorbed by the service district or the general purpose governments.

The property and personnel of the general-purpose governments involved with water and sewage treatment would also have to be transferred to the service district. The terms of the necessary agreements for these property and personnel transfers must be set forth in the initial service district plan. For example, the Occoquan Reservoir and treatment facilities and the personnel connected with them would be transferred from the Fairfax County Water Authority to the service district. The service district would assume the outstanding debts or pay them off with new bond issues. The Authority's distribution system and personnel would be absorbed by the Fairfax County Department of Public Works or, perhaps, by a new department of the County Government. In Prince William County, the County Government would assume responsibility for the water distribution and sewage collection systems of the sanitary districts and any sanitary district services, such as street lights, which are not related to water or sewage treatment.

A minor problem is that the portion of the important Occoquan Watershed in Fauquier County cannot be included in the service district because it is not part of the Northern Virginia Planning District, as defined by the Division of State Planning and Community Affairs. That portion of Fauquier County could be served by the District under a contractual agreement.

The major problem with the service district alternative is the difficulty in creating a service district which would include water supply and sewage treatment. At present there is no concerted effort being made for the creation of a service district to provide any type of service. The Charter Agreement of the Northern Virginia Planning District Commission specifically excludes any commitment to or expression of support for a service district. It is especially difficult to foresee Loudoun County becoming part of a Northern Virginia Service District because it has not yet even joined the Northern Virginia Planning District Commission.

Because urban and suburban development is heavily influenced by patterns of water and sewage development, local governing bodies and residents are very reluctant to give up control over them. They fear a regional unit will not pay sufficient attention to their needs and wishes.[155] In addition, individual authorities and special districts show a marked tendency toward preoccupation with their own programs and jurisdictions and work to preserve traditional arrangements as they see them.[156]

The General Assembly made creation of the service district particularly difficult by requiring the approval of a majority of the voters within each political subdivision in the proposed district.[157] There are no provisions to allow a district to serve those areas which are in favor of the plan and exclude those subdivisions opposed to it. There is also some difficulty in deciding whether the Act requires a majority of the voters in each political subdivision to approve it or, more reasonably, a majority of those voting in the election in each subdivision, which is all the Virginia Constitution requires. The statutory section creating service districts clearly states that a district may be created by "...the concurrence of a majority of those voting..." in each subdivision.[158] But other sections of the Act refer to a "...majority of the voters of each governmental subdivision...."[159] The amendment section of the Act definitely requires "...the concurrence of a majority of the qualified voters of each of the governmental subdivisions...."[160]

Local concern over control of water and sewerage facilities is understandable, but those advocating continued local control must remember that the need for an areawide approach developed from local inaction and an increasing local inability to act. The important homebuilding industry may actually support a service district plan because it would give them better sewerage facilities and, thus, protection from on-and-off building moratoriums imposed by the Water Control Board. However, any plan which would receive support from the homebuilders would be opposed by those groups against increased development in many areas of Northern Virginia.

Creation of a service district to provide wholesale water supply and sewerage service would be politically difficult, but it has the best administrative, economic, and engineering possibilities.

Northern Virginia Water and Sewer Authority - A second, but less effective, alternative for water quality management in the Virginia portion of the Washington Metropolitan Area would be the creation of an areawide water and sewer authority under the Virginia Water and Sewer Authorities Act.[161] The creation, organization, and powers of such an authority are outlined beginning at page 69 supra. The organization would be similar to that of the Fairfax County Water Authority, Alexandria Sanitation Authority, or the Loudoun County Sanitation Authority, except that the governing board would be made up of representatives of several political subdivisions and would have areawide jurisdiction for both water supply and sewage treatment.

As in the service district alternative, the Northern Virginia Water and Sewer Authority would provide wholesale water supply and sewage treatment services to the member political subdivisions. Fauquier County could become a member; but since only part of the County is in the Occoquan Watershed, it may be best to serve that portion of the County under a contractual agreement. Again, as in the service district alternative, the Authority would take over the water supply reservoirs, water treatment plants, water transmission mains, sewage interceptors, and sewage treatment facilities of the existing authorities, sanitary districts, and general-purpose governments. Where they do not already do so, the general-purpose governments would assume the operation and maintenance of the local water distribution and sewage collection systems. The details of those property transfers would be included in the Authority's Articles of Incorporation.

The main advantage of a Northern Virginia Water and Sewer Authority over a service district is that the Authority can be created by concurrent resolution or ordinance of the governing bodies of the participating political subdivisions. A referendum is required in a political subdivision only if the governing body calls for one or if ten percent of the qualified voters petition the governing body for one. If a referendum is held in a political subdivision, approval by a majority of those voting is sufficient. Thus, the creation of an areawide water and sewer authority would be easier than the creation of a service district.

The areawide authority would increase the opportunities for achieving economies of scale and ensure areawide water and sewer planning. While reducing the number of governmental units in the area, it is not a major step toward reducing governmental fragmentation because of its being limited to three functions; provision of water, sewerage, and solid waste disposal services. Of course, this limitation will make it more politically acceptable since it cannot be labeled a "super government" as the service district can be.

The authority would also suffer from other disadvantages common to special district governments. The members of the governing body are appointed rather than directly elected, and, thus, probably less responsive to the wishes of the public. To finance its capital projects, the authority would have to issue revenue bonds rather than lower interest rate general obligation bonds. The authority's limited scope will also cause it to be self-centered and tend to inhibit coordinated planning with units of government providing other public services.

Although having a better chance of acceptance than a service district, a Northern Virginia Water and Sewer Authority or just an areawide sewer authority would still face much opposition. The reasons for opposition would be similar to those working against creation of a service district. Governing bodies and the public are reluctant to give up local control over water and sewer service because of their impact on development rates and patterns. The existing authorities, sanitary districts, and public works departments also want to protect their interests.

Northern Virginia Sanitation District and the Occoquan Watershed - The author does not believe that a sanitation district is a worthwhile alternative, but it is discussed here because an organization similar to that of the Hampton Roads Sanitation District is being considered for the Occoquan Watershed. The Hampton Roads Sanitation District was created in 1940 by special act of the General Assembly[162] in accordance with the provisions of the Sanitation District's Law of 1938.[163] In 1960 a special act of the General Assembly rewrote the legislative basis for the Hampton Roads Sanitation District, including a change allowing the issuance of revenue bonds without a referendum.[164]

The Sanitation District's Law of 1938 is limited to territory within which are located tidal waters. The Sanitation District's Law of 1946[165] provides for territory embracing non-tidal waters, and a district created under the Act cannot embrace tidal waters. There are no provisions in the Virginia Code for a sanitation district including both tidal and nontidal waters.

The Sanitation District's Laws of 1938 and 1946 are very similar. The main difference, other than the tidal and nontidal waters distinction, is that the 1938 Law provides for a governing commission of five members appointed by the Governor, and the 1946 Law provides for a governing commission of seven members appointed by the State Health Commissioner. The creation of either a tidal or nontidal district requires the approval of the governing bodies of each political subdivision, a court hearing and determination that the district would be in the public interest, and a referendum in which the majority of those voting in the proposed district must approve. If a majority of any political subdivision votes "no," that subdivision is excluded from the district.

Despite the difference in the sanitation district laws for tidal and nontidal waters, a Northern Virginia Sanitation District covering both tidal and nontidal waters could be created by special act of the General Assembly. However, a Northern Virginia Sanitation District similar to the Hampton Roads Sanitation District would have several major weaknesses. First, it does not include any provision for water supply; and the argument has been made in this paper that water quantity and quality should be the responsibility of a single operating agency. Also, since an areawide water supply agency is needed, the future would see two separate single-purpose agencies instead of the preferable dual-purpose or multipurpose organization. A second, and very significant, weakness is that the governing body of the district would be appointed by the Governor and subject to removal by him. Thus, the residents of the district would have almost no control over the governing body. A weakness of a sanitation district for the Occoquan Watershed alone is that the district would only include part of a single, rapidly developing area. It would be very difficult to plan for development or non-development of the Occoquan Watershed without having control over and considering many events occurring outside the Watershed. This is apparent when a major part of the recommended pollution abatement plan for the Watershed calls for exporting treated effluent from the Occoquan Watershed.

If the effort is made to get Fairfax, Loudon, Prince William, and Fauquier Counties to agree on a water quality management organization for the Occoquan, Arlington County and water supply considerations should be added to the discussions, and a lasting solution for all of Northern Virginia formulated. For once, the governments concerned should attempt to do more than just "get through" the present crisis. The residents of Northern Virginia expect and deserve a little more farsightedness.

An example of extreme nearsightedness and doing the minimum required is a compact proposed for the Occoquan Watershed by Fairfax County.[166] The proposed compact would consist of members of the Boards of Supervisors from Fairfax, Loudon, Prince William, and Fauquier Counties and would oversee planning in the Watershed, deal with the Virginia State Water Control Board in relation to State and Federal grants, and generally set standards for development within the Basin.

The Northern Virginia Planning District Commission already has the authority to oversee planning and set standards for development within all of the Watershed except for that portion in Fauquier County. The idea of the compact organization dealing with the Water Control Board for State and Federal grants is ridiculous when, under the compact plan, the localities would be responsible for financing sewage facilities in their areas. Thus, the compact would only be a "go-between" to meet the Water Control Board's requirement for a regional organization. The compact plan does not provide for any regional sewerage facilities at all.

There is no provision in the Virginia Code for such a compact, but political subdivisions can agree to jointly exercise any of their powers.[167] Hopefully, the Water Control Board will see the nothingness of Fairfax County's compact plan and reject it.

Countywide Water and Sewer Organizations - Although far from ideal, consolidation of the existing governmental units for water supply and water pollution control into countywide water and sewer organizations would be an improvement over the existing arrangements. Loudon County already has the countywide Loudoun County Sanitation Authority which provides both water and sewerage services. The towns in Loudon County could contract with the Sanitation Authority for water and sewerage services. Arlington County also has a countywide organization. Its Utilities Department provides both water and sewerage service.

In Fairfax County the Department of Public Works could assume the facilities and operations of the Fairfax County Water Authority, or the Water Authority could assume the sewerage operations of the County Department of Public Works. The Fairfax County Board of Supervisors can assume the obligations of the Water Authority and dissolve it by resolution.[168] As indicated before, the Charter of the Fairfax County Water Authority was amended in 1959 to allow it to acquire, construct, and operate sewerage facilities. The best plan would be for the County Department of Public Works to assume the facilities and operations of the Fairfax County Water Authority. This would eliminate a separate governmental unit and allow water supply and treatment facilities to be financed by lower interest rate general obligation bonds rather than revenue bonds. Another advantage of the County Government assuming water supply responsibilities is that the elected County Board of Supervisors is closer to public opinion concerning water service than are the appointed members of the Authority's governing board. In addition, it is desirable for elected officials to be in a position to set priorities and allocate resources among the various public requirements.[169]

In Prince William County, for the reasons given above, it would be best for the County Department of Public Works to provide countywide water and sewerage services. However, essentially the same results could be achieved by a countywide sanitary district, since the governing body of the sanitary district would be the County Board of Supervisors. This would not be a drastic step, because the County Board of Supervisors is the governing body of the six existing sanitary districts in the County. The present districts could be operated as separate divisions because of their physical separation but the engineering and administrative staffs concolidated. The Towns of Manassas and Manassas Park could join the County sanitary district. However, this would make it more difficult for the Town to annex areas of the County because they couldn't argue the provision of better water and sewerage services. Concern over possible future annexation fights is a significant inhibition to improved cooperation between counties and cities or towns.

With countywide financial and operating base, Prince William County or a countywide sanitary district could then contract with Fairfax, Loudoun, and Fairfax Counties for the construction and operation of sewerage facilities for the Occoquan Watershed. A feasible plan would be to provide secondary sewage treatment within the Watershed and then send the secondary effluent to a countywide sewage treatment plant on the Potomac River for tertiary treatment and nutrient reduction.

Alternative Institutional Arrangements Requiring Legislative Changes

Because of the service district unit of government provided for in the farsighted Virginia Area Development Act,[170] no major legislative changes are needed to arrive at a good organizational arrangement for water supply and water quality management in the Virginia portion of the Washington Metropolitan Area. Some minor changes in the Act could be made to make creation of a service district a little easier. The Virginia General Assembly could amend the Area Development Act to make clear whether a majority of the qualified voters in each political subdivision must approve creation of a district or whether a majority of those voting in each subdivision is sufficient. The referendum requirements for an amendment to the service district plan should be reduced to a majority of those voting in each subdivision. The requirement that the voters in all of the governmental subdivisions in the proposed service district must approve should also be eased. Approval of the voters in enough political subdivisions to embrace a majority of the population in the proposed district should be sufficient for creation of the service district. Those governmental subdivisions in which a majority was opposed could be excluded from the initial service district but be allowed to join at a later time.

VI

EXISTING AND ALTERNATIVE INSTITUTIONAL ARRANGEMENTS IN MARYLAND

Existing Arrangements

The Maryland portion of the Washington Metropolitan Area, as defined in this paper, includes Montgomery, Prince Georges, and Charles Counties. Within the Suburban Maryland Area, water supply and sewerage services are provided by general governmental units, a State-created sanitary district, a county sanitary district, private companies, and Federal agencies. Other organizations influencing water supply and water quality management decisions in the area include the Maryland-National Capital Park and Planning Commission, the county Soil Conservation Districts, the Maryland Potomac Water Authority, the Maryland Department of Health and Mental Hygiene, the Maryland Department of Natural Resources, the Water Quality Office, and other Federal agencies.

General Governmental Units

Counties, cities, and towns in Maryland derive their power to carry on water supply and water quality management activities from several areas of the Maryland Code. Sections 78 to 91 of Article 23B of the Maryland Code outline the powers a city or town has in regard to water supply and sewerage. A city or town may construct, operate, and maintain a water system and water plant, a sewer system and sewage treatment plant, and a stormwater drainage system. The city or town may also extend its water and sewerage systems beyond the town limits, contract with any party or parties for water and/or sewerage services, and regulate private water and/or sewerage systems. However, none of these powers extend to any city or town in a sanitary district or other special districts authorized to provide water and/or sewerage services.

Article 43 of the Maryland Code contains other provisions relating to water supply and sewerage. To finance water and sewerage projects, a city or town may issue general obligation bonds.[171] A referendum is required for bonds financing a water supply system;[172] but under the Sanitation Facilities Bond Act of 1957, general obligation or revenue bonds for sewerage facilities can be issued without the need for a referendum.[173] The Sanitary Facilities Bond Act also allows a city or town to issue general obligation and revenue bonds for sewerage facilities without regard to a debt limit and, where facilities have been ordered by the State Department of Health or a competent court, without regard to an unfavorable referendum vote.

Article 25 includes provisions allowing counties to establish public drainage associations[174] and public watershed associations[175] and to provide for erosion control.[176] The powers and responsibilities of counties in regard to providing water supply and sewerage services are not specifically set forth anywhere in the Maryland Code. Under Sections of Article 43, the counties may indirectly provide these services through creation of water and/or sewer authorities[177] and sanitary districts.[178] However, water and/or sewer authorities may not compete with existing public or private utilities, and the Sanitary District's Law does not apply to Montgomery and Prince Georges Counties. There are no water and/or sewer authorities, only the Charles County Sanitary District, in the Maryland portion of the Washington Metropolitan Area. The major water supply and sewerage responsibilities of Maryland counties evolve from the State requirement that the governing body of each county must adopt countywide, ten-year water and sewerage plans and annually review and amend them.[179]

In Montgomery and Prince Georges Counties, the ten-year plan must be prepared by the Washington Suburban Sanitary Commission (WSSC) following goals, purposes, and concepts established by the County governing bodies; and the governing bodies can amend the WSSC plan as they see fit. After adoption of any county water and sewerage plans, no State or local authority can grant building permits or approve subdivision plans unless the proposed construction and development are in accordance with the County plan.

Only two cities and three towns in the Maryland portion of the Washington Metropolitan Area provide water and sewerage services through public works departments.

City of Bowie - The City of Bowie is in the Washington Suburban Sanitary District, but the City's Public Works Department provides water supply and sewerage services to the Belair section of the City. The City operates a 6 mgd well-water system and the 2.2 mgd Belair Sewage Treatment Plant as a lessee from Levitt & Sons, Inc., the developers of Belair. The plant discharges into the Patuxent River Watershed. The WSSC provides water and sewerage services to the remainder of the City.

City of Rockville - The City of Rockville is not in the Washington Suburban District, but the WSSC continues to serve a section of the City it served prior to annexation by Rockville. The Rockville Public Works Department provides the remainder of the City with water from a 6 mgd Potomac River water treatment plant. The City's sewage flows into the WSSC's system and thence to the District of Columbia Water Pollution Control Plant.

Town of Upper Marlboro - This Prince Georges County Town operates a small well-water system and discharges sewage into the WSSC system for treatment at the Western Branch Wastewater Treatment Plant which is in the Patuxent River Watershed.

Town of Indian Head - Indian Head is in Charles County, and the Town operates a small well-water system and a small sewage treatment plant.

Town of LaPlata - This Town is also in Charles County and also operates a small well-water system and a small sewage treatment plant.

Washington Suburban Sanitary Commission

The Washington Suburban Sanitary Commission is the largest water supply and sewerage organization in the Washington Metropolitan Area and serves approximately one million people. The Washington Suburban Sanitary District and the Commission were created by the Maryland General Assembly in 1918 to serve those areas of Montgomery and Prince Georges Counties contiguous to the District of Columbia.[180] Today the WSSC is responsible for all of Montgomery County except the City of Rockville and all of Prince Georges County except for Belair-Bowie and the Town of Upper Marlboro.

The Acts creating the WSSC and defining its powers, responsibilities, and organization are codified in the Public Local Laws of Montgomery County (1965 Ed.), Chapter 71 and in the Public Local Laws of Prince Georges County (1968 Ed.), Section 83. However, these sources were not easily available to the author; and the powers, responsibilities, and organization of the WSSC were obtained from the Session Laws of the Maryland General Assembly.

At present the governing body of the WSSC consists of six Commissioners serving staggered four-year terms. Three Commissioners are appointed by the Montgomery County Council and three are named by the Prince Georges Board of County Commissioners.[181] No more than two of the three Commissioners from Montgomery County may be from the same political party.[182]

Besides providing water supply and sewerage services, the WSSC is empowered to provide refuse collection and disposal services,[183] and it does operate a sanitary landfill. The Commission is also responsible for approving or disapproving the location and construction of all utilities in public ways within the district[184] and for the adoption and enforcement of erosion control regulations for utility construction within the Patuxent Watershed portion of the district.[185]

The WSSC may finance its activities by issuing bonds guaranteed by Montgomery and Prince Georges Counties.[186] The bonds may be paid off by a property tax levied by the Counties[187] and service charges which may vary on an area or subdistrict basis.[188]

The strong position that the WSSC holds in the State of Maryland can be seen by the exceptions made for it in the Maryland Constitution and Code. Article III, Section 40-C of the Maryland Constitution prohibits the General Assembly from enacting any law authorizing the taking of private property without just compensation, as agreed upon between the parties or by a jury, first being paid or tendered, except for the WSSC in Prince Georges County. The Constitution specifically allows the General Assembly to pass a law authorizing the WSSC to take up to one-half the land for any project in Prince Georges County immediately upon payment of an appraised fair value to the owner or into a court. This Section of the Maryland Constitution was ratified in 1966, and a law taking advantage of it was passed in 1967. The law provides for the immediate taking of the property, but the WSSC is then bound by the final court determination of the property's fair value.[189]

The Maryland Code makes WSSC rules and regulations superior to municipal ordinances[190] and will not allow a municipal corporation to amend its charter in a way which would impair the Commission's sanitation and water and sewer related powers.[191] In addition, none of the water and sewerage powers granted to municipalities in Article 43 of the Code are to affect the WSSC.[192]

The major control over the WSSC is exerted by Montgomery and Prince Georges Counties through the appointment of Commission members and through the Counties' power to approve, reject, or amend the County ten-year water and sewer plans[193] and the WSSC's six-year capital improvement program.[194] The Maryland-National Capital Park and Planning Commission also has the right to review the County ten-year water and sewer plans prepared by the WSSC. The Park and Planning Commission does not have veto power over the plans, but the County governing bodies must vote separately on each item recommended for change.[195] The Maryland Secretary of Health and Mental Hygiene also reviews and can approve or disapprove the ten-year plans.[196] Once a ten-year water and sewer plan is approved, no State or local authority can grant building permits or approve subdivision plans unless they are in accordance with the County plans.[197]

The WSSC operates two large water filtration plants to supply its customers. One is the 65 mgd Patuxent River Filtration Plant near Laurel, and the other is the 240 mgd Potomac River Filtration Plant in western Montgomery County. Because maximum water supply use is being made of the Patuxent River, future demands will most likely be met by enlarging the Potomac River facilities.

Most of the sewage from Montgomery and Prince Georges Counties is treated at the District of Columbia Water Pollution Control Plant. The Act creating the WSSC in 1918 gave the Commission full power to contract with the District of Columbia or any other Federal authority for water and sewerage services. The WSSC took advantage of this provision and negotiated the Maryland-District of Columbia Sewage Agreement of 1924, and amended it in 1954. Under the agreement, the District of Columbia accepts sewage from the WSSC, and the WSSC pays a pro rata share of the operating and construction costs. To date the WSSC has paid $15.6 million toward construction costs, and it pays nearly $2 million annually as its share of operating costs.[198] The WSSC's portion of the construction costs was made eligible for State aid in 1969.[199] The WSSC contributes 114 mgd of the 250 mgd being received at the D. C. Water Pollution Control Plant.[200] It has been asserted that the WSSC's "capacity rights" are limited to 67 mgd, and that it must make other arrangements for treating excess sewage.[201] The WSSC's share of the Potomac Interceptor accounts for 22 mgd of the alleged 67 mgd "capacity rights." Despite Federal plans to limit capacity at the D. C. Water Pollution Control Plant because of the need for increased treatment and a shortage of space, the WSSC's ten-year plan calls for increased use of the Plant.[202] The "capacity rights" and "limited expansion" controversies will be discussed later in this paper.

The WSSC also plans to contract for the treatment of sewage from the Mattawoman Creek Basin of southern Prince Georges County. It is negotiating with the Charles County Sanitary Commission for "capacity rights" in a proposed sewage treatment plant to be build on Mattawoman Creek. The WSSC has full power to enter into contracts with any Federal, State, county, or municipal authority in Maryland or other States.

Three sewage treatment plants are actually owned and operated by the WSSC. The Piscataway Plant is in the Potomac River Basin, and the Parkway and Western Branch Plants are in the Patuxent River Basin. The Piscataway Sewage Treatment Plant is a secondary treatment facility with an 8 mgd capacity. The Maryland Secretary of Health and Mental Hygiene has ordered an expansion of the Plant to 30 mgd by the end of 1972, and tentative WSSC plans call for expansion to 60 mgd by 1984. With substantial financial aid from the Federal Government, the WSSC is constructing a 5 mgd advanced waste treatment addition to the Piscataway Plant.

The present Piscataway Plant and plans for its expansion are receiving considerable public opposition.[203] The opposition has developed mainly because of a deterioration in water quality in the Piscataway Embayment. Much of the Piscataway controversy has been centered around the refusal of the National Park Service to give the WSSC a permit to build an effluent line across parkland so that the Plant effluent could be discharged directly into the Potomac and what conditions should be attached to such a permit.

The Parkway Sewage Treatment Plant has a 2.4 mgd capacity and serves part of the Patuxent River Basin, including the city of Laurel. Present plans call for expansion of the Plant to 7.5 mgd. The 5 mgd Western Branch Sewage Treatment Plant is also in the Patuxent River, and a future capacity of 30 mgd is anticipated.

Charles County Sanitary District

The Charles County Sanitary District was created under the provisions set forth in Sections 645 to 673 of Article 43 of the Maryland Code. A single-county sanitary district can be created by a resolution of the County governing body which names the first members of the district commission and contains the articles of incorporation. The corporate existence of the district begins when the State Department of Assessments and Taxation issues a certificate of approval after the articles of incorporation are filed.

A one-county sanitation commission consists of three members appointed by the County governing body for staggered six-year terms. The district may construct, purchase, maintain, and operate water and sewerage systems and may contract with Federal, State, and municipal agencies, corporations, or individuals in Maryland or adjoining States. To finance its facilities the district can issue, with approval of the County governing body, bonds backed by the full faith and credit of the district and County.

The Sanitary District provides the Waldorf Area with well water and operates an oxidation pond for sewage disposal. The oxidation pond is to be abandoned when a Mattawoman creek interceptor and sewage treatment plant are constructed. Arrangements for the use and financing of the interceptor and treatment plant are being negotiated with the WSSC.

Private Water and Sewerage Companies

Under Article 23 of the Maryland Code, corporations formed for supplying water have the power to acquire and possess land, water rights, and other property and, with the permission of local authorities, may lay pipe and construct works.[204] The corporations also have the right of eminent domain.

Nothing is specifically said about the powers of a corporation providing sewerage service, but Article 78 requires authorization from the Maryland Public Service Commission before any individual, association, or corporation may construct a water or sewage disposal system for public use.[205]

There are several private water and/or sewerage systems in Montgomery, Prince Georges, and Charles Counties. Most of the systems are very small, and they include the Pomonk Utilities, Inc. well-water system and the Charles Utilities, Inc. water and sewerage systems in Charles County. The most significant private systems are the 2.2 mgd Belair Sewage Treatment Plant in Bowie and the 1.3 mgd Marlboro Meadows Subdivision sewage treatment plant in Prince Georges County. Both plants discharge into the Patuxent River Watershed. Since the Marlboro Meadows plant is in the Washington Suburban Sanitary District, its plans and construction had to be approved by the WSSC; and its operation is under general control of the Commission.

Maryland Potomac Water Authority

In 1969 the General Assembly created the Maryland Potomac Water Authority to conserve, control, and put to beneficial use the storm and flood waters of the rivers and streams of the Potomac River Watersheds in Allegheny, Frederick, Garret, Montgomery, Prince Georges, and Washington Counties.[206] The immediate purpose of the Authority is to contract with the Federal Government for the purpose of acquiring storage in the Bloomington Dam project of the U. S. Army Corps of Engineers.

The governing body of the Authority consists of ten members. The heads of the Departments of Water Resources and State Planning and the General Manager of the WSSC are ex officio, nonvoting members. One member is from each of the governing bodies of the member Counties, and a voting chairman is appointed by and serves at the pleasure of the Governor. Project costs are to be paid by assessing and collecting funds from the member Counties. The Authority may also contract with non-Maryland users.

Patuxent River Watershed

The General Assembly has authorized the governing bodies of Montgomery, Prince Georges, Charles, Howard, Anne Arundel, Calvert, and St. Mary's Counties to define and create the Patuxent River Watershed in their Counties and to act cooperatively for the protection of the Watershed.[207] In Montgomery and Prince Georges Counties, the Maryland-National Capital Park and Planning Commission is to act in place of the County governing bodies. The General Assembly has also required that future sewage treatment plants within the Watershed anticipate the need for advanced waste treatment and nutrient removal. Existing plants must meet the State's standards by July 1, 1974. If the necessary steps for compliance are not taken, the Counties or, in Montgomery and Prince Georges Counties, the WSSC shall, upon 30-days written notice from the Department of Health and Mental Hygiene, do the necessary work with the owners of the plants being liable for the value of the work. The Counties can only issue grading and building permits within the Watershed after the plans are approved by the Soil Conservation District and, if septic or private sewer facilities are involved, only after approval by the Department of Health and Mental Hygiene.

County Soil Conservation Districts

Montgomery, Prince Georges, and Charles Counties each have a Soil Conservation District to carry out soil and water conservation programs. Under Maryland Law a Soil Conservation District is governed by a five-member Board of Supervisors, of which two are appointed by the State Soil Conservation Committee and three are elected from the District.[208] The Districts do not have taxing and eminent domain powers and cannot borrow more than $50,000. Land-use regulations may only be adopted after publication, hearing, and approval in a referendum. Because of the above limitations, the main work of the Districts is sponsorship of Federal soil and water conservation programs.

Maryland-National Capital Park and Planning Commission

After the WSSC, the Maryland-National Capital Park and Planning Commission is the largest regional organization directly influencing water supply and water quality management decisions in the Maryland portion of the Washington Metropolitan Area. The Park and Planning Commission was established by the Maryland General Assembly in 1927 to provide public parks and planning services to those developing areas of Montgomery and Prince Georges Counties adjacent to the District of Columbia.[209] The Commission has responsibility for acquiring and maintaining parks in the Maryland-Washington Metropolitan District which now includes all of Montgomery County except certain municipalities such as Rockville and a small part of Prince Georges County. The Commission has general planning authority for the physical development of the Maryland-Washington Regional District which includes and extends beyond the Metropolitan District.

The governing body of the Park and Planning Commission is composed of ten members, five from each County with not more than three members from each County belonging to the same political party.[210] The members are appointed for staggered four-year terms by the respective County governing bodies. The five Commission members from each County also serve as the County Planning Board for each County and are responsible for planning and zoning functions which are limited to a single County as distinguished from the bicounty functions of the entire Commission. The adoption of a Commission resolution or recommendations affecting the bicounty area requires six affirmative votes, of which at least three must be from each County.

Financial support for the Park and Planning Commission comes from ad valorem taxes which the governing bodies of Montgomery and Prince Georges Counties are directed to levy and collect.[211] The Commission is also authorized to issue bonds guaranteed by the full faith and credit of the two Counties.[212]

The Park and Planning Commission or, at the county level, the County Planning Board must approve subdivision plans before they can be recorded, can issue subdivision regulations, and can recommend zoning changes.[213] The County governing bodies retain actual control over zoning regulations, with the Commission only having delaying powers. The laws relating to the Maryland-Washington Regional District prohibit the issuing of a building permit unless adequate provision is made for disposing of waste, sewage, and drainage. The Commission is given the power and authority to adopt all necessary rules and regulations to assure adequate sewage disposal from all buildings in the District. The Commission has not made any significant use of this authority. The main activities of the Commission relating to water supply and pollution control are as follows:

1. Review of the ten-year water and sewerage plans for Montgomery and Prince Georges Counties.

2. Acting for Montgomery and Prince Georges Counties in protecting the Patuxent River Watershed.

3. Flood plain management.

4. Acquiring and maintaining major stream valleys for parks.

5. Sediment control in cooperation with the Counties, Soil Conservation Districts, and the WSSC.

Although deeply interested in orderly development and sound water quality management in the bicounty areas, the Park and Planning Commission, like the Northern Virginia Planning District Commission, is reluctant about accepting any areawide master plan prepared by another organization. The Park and Planning Commission believes that existing institutional structures are adequate for restoring water quality in the area, and only money and direction are needed.[214]

State Influence

The State of Maryland plays a major role in water supply and water quality management activities. In the Maryland portion of the Washington Metropolitan Area, the Department of Health and Mental Hygiene and the Department of Natural Resources are the main State agencies influencing water supply and water quality management decisions. Both Departments are represented by Conferees at the Potomac Enforcement Conference. The Department of State Planning plays a lesser but growing role.

Department of Health and Mental Hygiene

Section 206 of Article 41 of the Maryland Code provides for the creation of the Department of Health and Mental Hygiene, but its powers and duties are set forth in Article 43, Health. Most of the powers and duties of interest in this paper are found in the sub-title Water, Ice, and sewage.[215]

The Secretary of Health and Mental Hygiene has general supervision and control over the waters of the State, insofar as their sanitary and physical conditions affect the public health or comfort, including the power to make or enforce rules and regulations, to pass upon the design and construction of public water supply and sewerage systems, and to compel operation of public water supply and sewerage systems, and to compel operation of public systems in a manner to protect the public health and comfort. The Secretary can also order alterations or extensions or the installation of a new system, the closing of private or public water supplies dangerous to health, and the abandoning of sewerage systems dangerous to health or comfort. No water supply or sewerage system can be installed or materially altered without a written permit from the Secretary. The Secretary has similar controls over industrial pollution and industrial wastewater treatment plants. If the State, or any County or municipality is served by an order of the Secretary for new facilities, with the approval of the Governor and the Attorney General, the necessary funds may be raised by the issuing of general obligation bonds without prior legislative enactment or any required referendum.

The Code directs the Secretary to consult with and advise County and municipal authorities as to water supply and sewage disposal. He is also to assist them in developing comprehensive master plans and to coordinate plans upon a regional basis where deemed advisable. The Secretary's strongest planning influence comes from his power to approve or disapprove the County ten-year water and sewerage plans.

The Department of Health and Mental Hygiene exerts further influence through its control of planning and construction grants. It is the designated State water pollution control agency for approving projects eligible for Federal construction grants,[216] and is the administrator of the State grants and loans made possible by the Maryland Water Quality Loan Act of 1968.[217] One purpose of the Maryland Water Quality Loan Act was to provide funds for the development of effective, comprehensive water quality control and abatement plans for river basins. A metropolitan area can be regarded as a river basin for which a water pollution control program can be effectively planned and implemented.

Department of Natural Resources

The Department of Natural Resources is composed of several smaller Departments, the main ones of interest here being the Department of Water Resources and the Environmental Service. The Department of Natural Resources is referred to as a principal Department with a Secretary as its head, and the Department of Water Resources is referred to as a Department and is headed by a Director.

The Department of Water Resources is responsible for supervising and planning the multipurpose development of State waters in the best interests of all inhabitants of the State.[218] A public hearing must be held and a permit issued by the Department before any waters of the State can be appropriated for other than domestic or farming use and before construction or repair of reservoirs, dams, or waterway obstructions.

The pollution abatement powers and responsibilities of the Department of Water Resources were increased during the 1970 session of the General Assembly.[219] The stated purpose of the Pollution Abatement Subtitle of Article 96A of the Maryland Code[220] is to improve, conserve, and manage the quality of the waters of the State. Section 25 of the Subtitle gives the Department power to do the following:

> to adopt, modify, and repeal water quality and effluent standards;
>
> to issue orders prohibiting wastewater discharges and requiring construction or modification of treatment facilities or adoption of other reasonable measures to prevent, control, or abate pollution;
>
> to require prior submission of plans, specifications, and other data and to inspect the construction of disposal systems in connection with the issuance of permits or approvals;
>
> to revoke, issue, or modify wastewater discharge permits and permits for installations, modification, or operation of disposal systems;
>
> to require proper operation of disposal systems; and to exercise necessary incidental powers.

These powers duplicate many of the powers which the Department of Health and Mental Hygiene has and exercises. In practice, the Department of Water Resources has primary responsibility for control of industrial wastewater discharges and the Department of Health has primary responsibility for control of water pollution from domestic sewage. From a technical and managerial viewpoint, it would be best to give the Department of Water Resources responsibility for and control over both industrial and domestic wastewaters . The Department of Health should retain its duties and powers relating to health aspects such as drinking water standards.

The Pollution Abatement Subtitle makes it unlawful to cause pollution, violate effluent standards, or reduce water quality below the established standards, and classifies such action as a public nuisance. Violations are misdemeanors and punishable with a fine up to $10,000 and/or imprisonment not to exceed one year, and each day of violation is a separate offense.

Under the Water Quality Loan Act of 1968, as amended in 1970 the Department of Water Resources is to recommend to the Governor a proposed scope of comprehensive river basin planning activity and the boundaries of river basin, watershed, and multicommunity areas to be studied. The Department is also to adopt rules and regulations to guide development of the basinwide or areawide programs.

The Maryland Environmental Service was created by the General Assembly in 1970 "...to provide waste purification and disposal services in compliance with State laws, regulations, and policies...to public and private instrumentalities, and with safeguards to protect the autonomy of the political subdivisions and the rights of the private entities it serves."[221] The Service is restricted to the provision of wholesale waste treatment services to local governmental units. It does not have any land use, zoning, or sewer location powers. The Service is within the Department of Natural Resources; and although it is in the initial stages of formation and is not yet operating any facilities, it holds great promise for water pollution control in Maryland. The Service also has solid waste disposal functions, but they will not be considered in this paper.

A Director, Secretary, and Treasurer appointed by the Secretary of Natural Resources, with the approval of the Governor, are the administrative officers of the Service and comprise the Board of Directors. The powers granted to the Service include the power to acquire, construct, lease, and operate projects within or without the State of Maryland; to acquire real property by the right of eminent domain; to borrow money and issue revenue bonds; to combine, after consultation with the municipalities affected, one or more wastewater purification projects with any other project as a single system for the purpose of operation or of financing; and to fix, alter, change, and collect fees and charges for its services. The Service does not have the authority to acquire, construct, or operate a project in any area which the Secretary of Health and Mental Hygiene finds to be receiving adequate service from a publicly owned project or will within a reasonable time be receiving adequate service, except upon the request of the appropriate municipality, district, or commission and pursuant to a voluntary contract between the Service and the municipality, district, or commission. This limitation puts some restraints on the ability of the Service to establish regional systems.

The growth of the Service will be dictated by the local acceptance of the five-year plans the Service is to prepare for each service region. Boundaries of the service regions are to be designated by the Director of the Service, after consultation with the Secretary of Natural Resources, the Secretary of State Planning, and the affected municipalities and on the basis of the needs set forth in the ten-year county water supply and sewerage plans. The five-year plans must also give due consideration to the county water and sewerage plans. The five-year plans are to designate the existing facilities to be transferred to the Service; new projects and their proposed method of acquisition, ownership, and operation; anticipated expenditures; sources of revenue; and the charges to be levied against municipalities. Adoption of a five-year plan by the Service requires at least one public hearing in each of the counties affected and approval by the governing body of each county affected or, in the event that the plan is not approved within 120 days following submission to the governing bodies, approval by joint resolution of the General Assembly is required.

After adoption of a five-year plan, service districts are to be established in those areas where the Service is to provide waste water disposal projects. A politically realistic section of the Environmental Service Act provides for compensation to the owners of existing projects which are transferred to the Service. The compensation may be based on the original cost of the project minus an allowance for depreciation, or on other terms satisfactory to the parties. The costs and obligations assumed by the Service in acquiring existing projects will be included in the charges levied against the service district.

The Service may provide wastewater disposal services at the request of any municipality, upon direction of the Secretary of Health and Mental Hygiene acting under Section 393 of Article 43 of the Maryland Code, and upon direction of the Secretary of Natural Resources acting pursuant to Article 96A.

Department of State Planning - This Department influences water quality management decisions through preparation, revision, and amendment of the State Development Plan and coordination of the plans and programs of Federal, State, and local govermental units. The State Development Plan is to include recommendations concerning proposed general locations of major public and private water supply and pollution control facilities which are of State concern.[222] The Department is the Governor's principal staff planning agency.

Federal Influence

The multitude of ways in which the Federal Government influences water quality management decisions in Suburban Maryland and the remainder of the Metropolitan Area were discussed beginning at page 16 *supra*.

Water Quality Management Problems in Suburban Maryland

Water supply and wastewater disposal operations in the Maryland portion of the Washington Metropolitan Area are straining and sometimes failing to keep pace with the rapid increase in population, but from an organizational viewpoint, the existing arrangements are relatively good. The WSSC is a bicounty organization which provides approximately 90 percent of the Suburban Maryland population with both water supply and sewage disposal services. The Charles County Sanitary Commission is already providing some water and sewer services to parts of Charles County and is planning for further expansion of its service area. Two cities and several towns have separate water supply and/or sewerage systems, but they are relatively small compared to the WSSC, and fragmentation of units is not a major problem.

The problems of the Patuxent River Watershed will not be discussed here, since only a small part of the Washington Metropolitan Area is within the Watershed. This paper is concentrating on that portion of the Potomac River within the Metropolitan Area. The Patuxent River Watershed is entirely within the State of Maryland, and the State is planning to protect and enhance the quality of the River and the Watershed by using a river basin approach.

Although Suburban Maryland does not have the seriously fragmented water quality management arrangement that exists in Northern Virginia, it does share that embarrassing stigma of inadequate planning and financing--a partial moratorium on sewer hookups.[223] The moratorium on new sewer hookups in several developing areas of Montgomery and Prince Georges Counties was instituted by the Maryland Department of Health and Mental Hygiene on May 20, 1970, and is still in effect with some modifications.[224] The moratorium has resulted because of overloaded sewers and overloaded sewage treatment plants. The Montgomery County Health Department has had to ask residents in the Cabin John Basin to reduce their water consumption to minimize the quantity of raw sewage overflowing into Cabin John Creek from an undersized sewer line.[225]

In addition to the water pollution resulting from the overloaded sewers and treatment plants, the inadequate sewerage system in Suburban Maryland has caused substantial direct economic losses in cancelled or postponed construction. It has been estimated that if the moratorium were to last for a year, Montgomery County would lose $67.1 million and Prince Georges County would lose $194.0 million in construction expenditures.[226]

The area has also experienced health hazards resulting from septic tank failures.[227] The use of septic tanks is promoted by the fact that the WSSC generally will not provide services where the project will not be self-supporting. Thus, the WSSC will seldom go far beyond its existing service area to provide isolated developments with sewerage. This is good business practice for an organization that is to be self-supporting; and if the public welfare dictates a different practice, the general-purpose government should pay the necessary costs. Every effort should be made to keep water supply and wastewater disposal systems on a self-supporting basis.

The major water quality management problems in Suburban Maryland concern the future of the District of Columbia Water Pollution Control Plant and the need for an additional wastewater treatment facility. There is also the need to meet the construction schedule and treatment efficiencies recommended by the Enforcement Conference.

The District of Columbia Water Pollution Control Plant receives nearly 80 percent of the Metropolitan Area's sewage, and it is overloaded. Suburban Maryland contributes 114 mgd of the Plant's average influent of 250 mgd. In the past, the WSSC has merely informed the District of Columbia of its anticipated flows and paid its proportional share for the capital and operating costs. However, after several years of discussion, the Federal Government decided in the spring of 1970 to limit suburban use of the Plant. The announcement of that decision was followed by several months of debate over what the limitations should be.[228] The debate included the threat of legal action by Montgomery County against the District of Columbia and the Department of the Interior. The dispute ended recently with agreement on a compromise plan which calls for increasing the capacity of the District of Columbia Water Pollution Control Plant to 309 mgd by 1974 and completing a regional treatment plant for the Maryland suburbs by 1977.[229] Both the expanded District of Columbia Plant and the new Maryland plant are to have advanced waste treatment processes.

An institutional problem in Suburban Maryland is the growing opposition to regional agencies at a time when there is an increasing need for regional solutions to regional problems. The Maryland-National Capital Park and Planning Commission has felt the opposition, and it has abdicated most of its powers to the separate County planning boards. There have also been efforts to split the WSSC into two separate County agencies. Such movement away from a regional approach is particularly disturbing, because the WSSC and the Park and Planning Commission were pioneering regional organizations when established in 1918 and 1927, respectively.

Institutional Alternatives Within Existing Law

Because the Washington Suburban Sanitary Commission is already providing 90 percent of the people in the Maryland portion of the Washington Metropolitan Area with water supply and sewerage services, no major changes are needed in the water quality management arrangement when analyzing the Suburban Maryland area alone. Some changes that could be made under existing law are the extension of the WSSC's services to additional areas of Montgomery and Prince Georges Counties and the absorption of the town and community systems in Charles County by the Charles County Sanitary Commission. Another and more far reaching change would be to have the Maryland Environmental Service assume the responsibility for wastewater treatment in Montgomery, Prince Georges, and Charles Counties.

Extension of the WSSC's Services

To reduce the number of water supply and sewerage systems in Montgomery and Prince Georges Counties and provide for more efficient operations, the WSSC could extend its services through purchase, condemnation, and contractual agreements. The WSSC has express authority to acquire municipal or private water or sewerage systems within the sanitary district by purchase or condemnation. Thus, the WSSC could purchase the Bowie-Belair water and sewerage systems or, if agreement could not be reached, it could acquire them by condemnation. The city of Rockville is not in the sanitary district, but the WSSC provides sewerage service under a contractual agreement. The WSSC could provide Rockville with water under a similar contract or under a more complex contract assume the operating responsibility for the City's water filtration plant. The Maryland Code gives all State and local authorities the power to enter into any contracts or agreements with the WSSC for water supply, sewerage, and drainage services.[230]

The governing bodies of Montgomery and Prince Georges Counties may want the WSSC to extend its service area so as to reduce the use of septic tanks in the Counties. These septic tanks often fail and create unhealthy conditions. However, septic tanks are usually installed in developments which, when begun, are remote from existing sewer lines. The developments are not provided with sewerage service because the WSSC feels the cost is too high and the extension project would not pay for itself. Admittedly, such economic decisions promote the use of septic tanks or small isolated sewerage systems, but the operation of the WSSC on a firm financial basis is a more important consideration. If the Counties feel an extension of service would be in the public interest, despite the cost, then they should pay the WSSC the difference between the cost of the extension and the revenues generated. Other alternatives would be for the Counties to require the developer to pay the cost of connecting with the WSSC system or prohibit such outlying developments through strict zoning ordinances.

Extension of the Charles County Sanitary Commission's Services

The present level of development in Charles County does not, of course, warrant the physical extension of a water and sewerage system throughout the County, but the Charles County Sanitary Commission should consider purchasing or at least operating several of the small water and sewerage systems in the County. Such an arrangement would ensure better and more efficient operation of the systems.

Under the Maryland Code, the Sanitary Commission has the power to acquire water or sewerage systems, to combine water and sewerage systems into a single system for operation and financing, and to enter into contracts and agreements with municipalities, corporations, or individuals.[231] However, the Sanitary Commission does not have the right to condemn any municipal or private systems which are operating satisfactorily and were in operation before the formation of the District in 1957.[232] The Commission does have the right to condemn water and sewer facilities which were built in the District after 1957. The best approach would be for the Commission to negotiate contracts providing for its operation of the small, private and municipal systems in the County. If, as planned, the Charles County Sanitary Commission plans, develops, and operates the Mattawoman Creek Sewage Treatment Plant, it will advance considerably both in size and experience.

Maryland Environmental Service

The WSSC and/or the Charles County Sanitary Commission may request the Maryland Environmental Service to provide wastewater treatment facilities for all or part of their service areas. The Service must then draft a contract with provisions specifying the nature of the facilities to be provided; the boundaries of the service district; and the terms, conditions, and costs under which the facilities would be provided. Upon execution of the contract, the Service would take the necessary steps to establish a service district and provide, maintain, and operate the necessary wastewater treatment facilities. The WSSC, the Charles County Sanitary District, and any cities or towns contracting with the Service would still maintain the sewage collection systems and bill their retail customers. The Service would provide, maintain, and operate only the treatment plants and major interceptors, and the costs would be charged to the WSSC and the other contracting parties which had retail customers. The Service has the power to combine, after consultation with the governmental units affected, one or more wastewater treatment systems into a single system for the purpose of operation or financing. Compensation for any existing wastewater treatment facilities, such as the Piscataway Plant, which are transferred to the Service could be based on the original cost less depreciation, or on other terms and conditions satisfactory to the parties.

In addition to the Piscataway Sewage Treatment Plant, the Service could be given the responsibility for the proposed Mattawoman Creek facility and the proposed plant to relieve the Maryland influent to the District of Columbia Water Pollution Control Plant. The Maryland Environmental Service also appears to be an ideal organization for providing a basinwide approach to water quality management in the Patuxent River Basin.

Because the WSSC is already a large regional organization, the advantages that the Service offers are not as attractive to the WSSC as they are to a smaller organization like the Charles County Sanitary

Commission. Nevertheless, the Service does offer these desirable features:[233]

> Permits rational distribution of water quality management costs between users, real assets, and current income, considering present and future values and local, State, and national objectives.
>
> Allows use of a regional approach, systems analyses, and modern management techniques.
>
> Personnel system that will attract and hold competent people.
>
> Provides equity for previous local investments.
>
> Protects and enhances the autonomy of local governments.

The governmental units with sewage treatment responsibilities would no longer have to issue bonds to obtain capital for the construction of sewage treatment facilities. The cost of the facilities would be included in the Service's annual charges, and the cost would probably be lower because the Service would be using lower interest rate State general obligation bonds authorized by the General Assembly or the Service's own revenue bonds.

In addition to retaining responsibility for sewage collection, the WSSC, the Charles County Sanitary District, and such cities and towns as Rockville and LaPlata would have to continue performing their water supply functions. The Maryland Environmental Service was not given any water supply powers because the need for a State water supply agency was not as immediate as the need for a State wastewater treatment organization. Other reasons are that people, and their legislators, are more protective of their water supply systems; and some regional State-level water supply agencies, such as the Maryland Potomac Water Authority, are already in existence.

Alternative Institutional Arrangements Requiring Legislative Changes

No significant legislative changes are needed to arrive at a good institutional arrangement for water quality management in the Maryland portion of the Washington Metropolitan Area. The basic arrangement of the WSSC serving all of Montgomery and Prince Georges Counties and a countywide Charles County Sanitary Commission is satisfactory and close to what already exists. If a Washington Metropolitan Area Water and Sewerage Authority is created, the representation of Suburban Maryland on the Authority's governing board would be best achieved by expanding the Washington Suburban Sanitary District to include Charles County. If a Metropolitan Area Authority is not created. Some consideration may be given to having the Maryland Environmental Service assume the responsibility for wastewater treatment in Suburban Maryland.

VII

EXISTING AND ALTERNATIVE INSTITUTIONAL ARRANGEMENTS IN THE DISTRICT OF COLUMBIA

Existing Arrangements

The District of Columbia is that portion of the territory of the United States ceded by the State of Maryland for the permanent seat of government of the United States "...including the river Potomac in its course through the District, and the islands therein."[234] The government of the District is unique. Under Reorganization Plan No. 3 of 1967[235] the District is governed by a presidentially appointed nine-member City Council and a presidentially appointed Mayor-Commissioner as the chief executive. The United States Congress legislates on all matters not delegated to the City Council.

The District government has the primary responsibility for water distribution, storm water control and disposal, and sewage collection, treatment, and disposal. The Washington Aqueduct Division of the U. S. Army Corps of Engineers has the responsibility for the District's water supply, and other Federal units such as Congress, the WQO, the National Park Service, and the National Capital Planning Commission influence water quality management activities in the District.

District of Columbia Government

It is the declared policy of the District of Columbia that "...with the advancement of technology and the availability of financial resources, such further orders and regulations as may be necessary be timely adopted with the ultimate goal of achieving the safe use of the Potomac River and its tributaries within the District of Columbia for all forms of water recreation...."[236] There are three major units of the District Government directly involved with water supply and water quality management; the City Council, the Health Services Administration, and the Department of Sanitary Engineering.

City Council - Part IV of Reorganization Plan No. 3 of 1967 and Chapters 15 and 16 of Title 43 of the District of Columbia Code give the City Council power to provide for the distribution, within the District, of water from the Washington Aqueduct and the power to fix rates for water and sewerage services. The water rates are not to be a source of revenue, "...but shall constitute a fund exclusively for the maintenance, management, and repair of the system of water distribution."[237] The Council also has the power to make regulations for the design, construction, and maintenance of sewage collection and treatment systems and to prescribe regulations for the operation and maintenance of sewage collection and treatment systems and to prescribe regulations for the operation and maintenance of the Potomac Interceptor.

The City Council cannot authorize the sale of general obligation or revenue bonds. The District's budget and finance arrangements are very complex. The Council does not have any appropriation powers, and its taxing power is limited to real estate taxes. The District budget is submitted to Congress by the President as part of the budget of the United States. Congress passes on each item in the District budget, and each year appropriates a payment to the District in lieu of real estate taxes. Water and sewerage operations and facilities are financed through two special funds in the U. S. Treasury, the District of Columbia Water Fund [238] and the D. C. Sanitary Sewerage Works Fund.[239]

To compensate for the District's inability to obtain capital for water and sewerage improvements through the sale of bonds, Congress authorizes limited loans from the U. S. Treasury to the Water and Sanitary Sewerage Works Funds. The interest on these loans is determined by the Secretary of the Treasury, and it must reflect the cost of money to the Treasury. One of the most significant and expensive water pollution problems in the District is the overflows from the combined sewer system. Costs for the maintenance and replacement of the combined sewer system must be divided between the Sanitary Sewerage Works Fund and the General Fund. That portion of the costs related to the sanitary sewage capacity of the combined sewers can be paid for from the Sanitary Sewerage Works Fund.

The U. S. Government makes annual payments into the Water Fund and the Sanitary Sewerage Works Fund for the water and sewerage services provided by the District. The U. S. must pay at the same rates applicable to other water and sewer customers.[240]

Health Services Administration - The Health Services Administration is the sole agency responsible for the implementation of the plan for enhancing the quality of the interstate waters within the District and for the enforcement of the water quality criteria adopted pursuant to the Federal Water Pollution Control Act, as amended.[241] Thus, the Health Services Administration is the "State" agency for water pollution control.

The Associate Director for Environmental Health has the responsibility for directing the Administration's water pollution control functions. To perform his duties, he has supervision of the Bureau of Public Health Engineering.

Department of Sanitary Engineering - The Department of Sanitary Engineering is the "local" operating agency. It is responsible for the planning and provision of sanitary services and facilities including water distribution, storm water collection and disposal, sewage collection and treatment, street cleaning, and refuse collection and disposal.[242] In this paper we are not concerned with the Department's street cleaning and refuse collection and disposal duties. The water, and sewerage operations of interest are under the supervision of the Associate Director for Water Services.

The Washington Aqueduct of the U. S. Army Corps of Engineers has been responsible for supplying the District with water since 1859. The Washington Aqueduct is discussed here because it is by statutory definition part of the District water system[243] and because its budget is part of the Department of Sanitary Engineering budget. The water supply facilities operated by the Corps of Engineers include intake structures on the Potomac at Great Falls and Little Falls, raw water lines to Dalecarlia Reservoir, the 164 mgd rapid sand filtration plant at Dalecarlia, and the 100 mgd McMillan slow sand filtration plant. The Department of Sanitary Engineering distributes the finished water within the District.

Water from the Washington Aqueduct is being used in Arlington County, Falls Church, and a part of Fairfax County including the Town of Vienna. In 1966 approximately 28 mgd of finished water was supplied to Northern Virginia.[244] The Secretary of the Army is authorized by statute to permit this diversion of water from the District.[245] The Commissioner of the District is authorized to deliver water to the WSSC and to connect with its system as long as the amount of water furnished does not exceed the amount that can be safely spared.[246] At present the WSSC does not obtain any significant quantity of water from the District, and the two water systems only have 11 small connections. The District does supply water to Andrews Air Force Base. There is surplus capacity in the Washington Aqueduct system, and it has been recommended that developing areas outside the District consider purchasing water from the Aqueduct of the District to meet their future needs.[247] This would make the District water system even more of a regional system.

The Department of Sanitary Engineering has complete responsibility for the District's sewage collection, treatment, and disposal facilities. The District's sewerage system is regional in that it receives significant amounts of sewage from the WSSC in Maryland and from several governmental units in Virginia including Arlington and Fairfax Counties, the Town of Vienna, and the Loudoun County Sanitation Authority. These sewerage agreements are authorized by statute.[248] The first agreement with the WSSC was entered into in 1924, and the present agreement dates from 1954. There are several agreements with Virginia localities, with the earliest dating from 1959.

All of the sewage collected within the District and the contributing areas of Maryland and Virginia is tributary to the District of Columbia Water Pollution Control Plant at Blue Plains. The Plant handles nearly 80 percent of the Metropolitan Area's sewage and is overloaded. The plant has a design capacity of 240 mgd and is receiving 249 mgd, of which 114 mgd is from Maryland, 11 mgd is from Virginia, and 124 mgd is from the District. This overloading at the Water Pollution Control Plant and the need for increased capacity and advanced waste treatment on a limited site are some of the major problems facing the Department of Sanitary Engineering. As noted at page 127 supra, there has been considerable debate over the future capacity and efficiency of the District plant, including what "capacity rights" the WSSC has in the existing plant and what rights it should have in an expanded facility. The result of the debate is a plan calling for increasing the capacity of the District Water Pollution Control Plant to 309 mgd by 1974 and constructing a second regional treatment facility in Maryland by 1977.[249] Both plants would have advanced waste treatment processes.

In 1960 Congress directed the District of Columbia to plan, construct, and operate a sewage interceptor, the Potomac Interceptor, to serve those upstream areas of Virginia and Maryland which would be influenced by growth pressures induced by the construction of Dulles International Airport.[250] This Congressional action resulted from political pressure based on a desire to protect the water supply intake reach of the Potomac from pollution.[251] The legislation established a special Metropolitan Area Sanitary Sewage Works Fund and authorized a $3 million Federal grant and a $25 million loan to the Fund. The District was given authority to establish charges and regulations for use of the Potomac Interceptor and to charge for the use of the District's sewers and sewage treatment facilities which receive the flow from the Interceptor. At the direction of the District Government, the Department of Sanitary Engineering built and now operates and maintains the Potomac Interceptor. In 1967 Congress reduced the amount repayable on the $25 million loan to $12.5 million so as to provide a total Federal grant of 55 percent of the total project cost. At present only 5 mgd of sewage is entering the District's sewerage system from the Potomac Interceptor, but the year 2000 design flow anticipates 22 mgd from Maryland and 42 mgd from Virginia.

In addition to the need for increased capacity and advanced treatment processes at the Water Pollution Control Plant, the District has a major water pollution problem resulting from its combined sewers. Approximately 40 percent of the District is served by combined sewers, and, during storms, large quantities of diluted raw sewage overflow into Rock Creek and the Potomac and Anacostia Rivers.[252] The District has been spending approximately $1.5 million per year since 1958 to separate portions of its combined sewers into separate sanitary and storm water systems, but at that rate it would take more than 300 years to completely eliminate the City's combined sewers.[253] Work on the Project C plan to reduce sewage overflows into Rock Creek and the Potomac and Anacostia Rivers is nearing completion, but the District does not have any serious plan for completely eliminating pollution from combined sewer overflows.[254]

Federal Influence

As expected, the Federal Government greatly influences water supply and water quality management decisions in the District of Columbia. The same Executive Branch departments and agencies which were discussed at page 16 supra are also active in the District. The Water Quality Office deals with the District's Health Service Administration in administering and enforcing the Federal Water Pollution Control Act. The Office of Management and Budget influences District decisions through its review of the D. C. budget.

The Legislative Branch of the Federal Government also can act fairly directly in the District's water supply and water quality management programs. Article I, Section 8, of the United States Constitution gives exclusive legislative jurisdiction within the District to Congress. Congress has delegated many of its powers to the City Council, but it has retained almost complete fiscal control. Congress has established the District of Colubmia Water Fund and the D. C. Sanitary Sewage Works Fund and has authorized the Secretary of the Treasury to make loans to the Funds, but the loans and disbursements from the Funds must be approved each year as part of the D. C. budget. To obtain the necessary funds for water supply or water pollution control projects, the District Government must get the approval of the House and Senate Committees on the District of Columbia and the District of Columbia Sub-Committees of the House and Senate Appropriations Committees. Of course, the full House and Senate and the President must approve the appropriation of funds for the projects.

Institutional Problems in the District of Columbia

The District Government is faced with two serious water pollution problems: its overloaded water pollution control plant which needs expansion and upgrading, and the elimination of its combined sewer system. Although these two problems are responsible for most of the pollution in the Potomac River, the District is doing a good job in light of the circumstances. The District hardly has enough money to even begin solving its water pollution problem, and it has no statutory authority to raise the money. In 1969, the Director of the Department of Sanitary Engineering reported he had only \$8 million for improvement of the D. C. Water Pollution Control Plant and only \$11 million was available for appropriation from the D. C. Sanitary Sewage Works Fund.[255] Thus, a maximum of \$19 million was available to finance the estimated expenditure of \$108 million to upgrade the plant to merely fulfill secondary treatment requirements.[256] The cost of higher levels of treatment and of nutrient removal facilities will be even larger, and the estimate for one method of eliminating pollution from combined sewer overflows and storm water runoff is a staggering \$1.2 billion.[257] Clearly the District Government's water quality management program needs substantial Federal aid and some form of independent funding authority to raise capital for its share of the pollution control costs. This authority can only be granted by the Congress.

In addition to the strictly cost aspects of the funding limitations which the District must labor under, the lengthy budget approval procedures also open its planning to review by several Federal units, each having a veto power. As enumerated before, the units are the Office of Management and Budget, the House and Senate Committees on the District of Columbia, and the District of Columbia Sub-Committees of the House and Senate Appropriation Committees. If a grant under the Federal Water Pollution Control Act is involved in the project, and it probably will be, then the Commissioner of the Water Quality Office and the Administrator of the Environmental Protection Agency must approve the project. At the District Government level, the Mayor and City Council must approve it. Thus, even if everyone agrees that "X" dollars should be spent on a water pollution control facility, there is a considerable chance of disagreement over when, where, and in what specific form that facility should be built.

Alternative Institutional Arrangements Within Existing Law

There is really no major problem with the organizational arrangement for water supply and water quality management within the District of Columbia itself. Except for the Corps of Engineers' operation of the Washington Aqueduct, the D. C. Department of Sanitary Engineering has the responsibility for all water and sewerage operations within the District, and this is a good arrangement. The real problems result from the District's lack of fiscal independence, and this can only be remedied by Congressional legislation.

The relatively minor problem of the disagreement between the District and the WSSC over the contract providing for WSSC use of the District's sewerage facilities could be solved by renegotiatiation of the contract or by a court test. The court action is, of course, not the better alternative, but it would end the disagreement. This disagreement over the contractual arrangements for the use of the D. C. Water Pollution Control Plant should be remembered. As the trend toward regional water pollution control facilities accelerates, there will be an increasing need for similar and even more complex contractual agreements. Those contracts must be drafted with extreme care and provide for maximum flexibility.

Alternative Institutional Arrangements Requiring Legislative Changes

Looking at the water quality management program in the District of Columbia itself, the primary need is for the District to have independent fiscal authority. If the District were to get authorization to issue general obligation and revenue bonds, the water pollution control program would almost certainly have to rely on revenue bonds. Even though the District Government is committed to improving the water quality in its interstate waters, it has even more pressing problems in its school, public welfare, housing, and crime control programs. These latter programs could easily use all of the general obligation bonds authorized.

Since it is unlikely at this time that the Congress would give the District Government independent budget and bonding authority, a more realistic alternative may be the creation of a District of Columbia Sanitary Authority. The Authority could be governed by a board, half of whose members were appointed by the Mayor-Commissioner with approval of the City Council, and half of which were appointed by the President with the approval of Congress. The Authority would take over all the operations of the Department of Sanitary Engineering and assume the water and sewer rate-making powers of the City Council with review by the D. C. Public Service Commission. Congress could then give the Authority independent budgeting and revenue bonding powers. However, because of the extremely high cost of separating the District's combined sewers and/or collecting and treating combined sewer overflows and storm water runoff, the Federal Government will still need to make substantial grants to the Authority to make the Nation's River a model for the Nation. Under this Authority arrangement, the District Health Services Administration would retain its status as the "State" water pollution control agency for the purposes of the Federal Water Pollution Control Act.

Congressional legislation should also be enacted to transfer the Washington Aqueduct from the Corps of Engineers to the D. C. Department of Sanitary Engineering or to the D. C. Sanitary Authority, if created. The Washington Aqueduct is the Corps' only municipal operating unit, and the present arrangement is only an organizational complication for the Corps of Engineers and the District of Columbia. The budget of the Washington Aqueduct is already considered as part of the Department of Sanitary Engineering's budget, and the Department is fully qualified to administer the personnel and operations of the Aqueduct.

VIII

CONCLUSIONS

1. The existing Potomac River Enforcement Conference does not include all of the Washington Metropolitan Area.and, therefore, is not considering many factors which influence water quality management decisions in the area.

2. Water quantity is related to water quality, and, ideally, the two should be the responsibility of a single organization.

3. There is considerable fragmentation of water supply and water quality management functions and responsibilities in the Washington Metropolitan Area, and this institutional fragmentation is hindering the pollution control effort.

4. The formulation, acceptance, and implementation of an areawide water supply and pollution abatement plan that will achieve the desired water quality in the Potomac River necessitate the consolidation and strengthening of the Metropolitan Area's existing institutional arrangements.

5. The Metropolitan Washington Council of Governments is an existing area wide organization already working on plans for alleviating many of the area's water supply and water quality management problems, and it would be the logical focal point for the planning of alternative institutional arrangements.

6. With the presence of the Council of Governments and existing legislation in Virginia and Maryland permitting regionalization of water pollution abatement facilities through a service district commission in Northern Virginia and the Washington Suburban Sanitary Commission or the Maryland Environmental Service in Suburban Maryland, there is already some basis for the consolidation and strengthening of the existing institutional arrangements.

7. Consideration should be given to the creation of a single organization to provide wholesale water supply and waste water disposal services to the Washington Metropolitan Area.

8. A Metropolitan Area organization to provide wholesale water supply and sewage treatment services could take one of the following basic forms:

   a. A Washington Metropolitan Area Water and Sewerage Authority modeled after the Washington Metropolitan Area Transit Authority;

b. A State-level, areawide operating agency also based on an interstate compact;

c. An areawide operating agency as part of a multipurpose regional government; and

d. Federal operating agency or authority.

FOOTNOTES

1. The Washington Post, October 3, 1965, §A, at 2, Col. 6.

2. *Third Session of Conference in the Matter of Pollution of the Interstate Waters of the Potomac River and Its Tributaries*, April 2, 3, 4, and May 8, at 165 (1969) [hereinafter cited as *Third Session of Conference*].

3. A. Kneese and B. Bower, *Managing Water Quality: Economics, Technology, Institutions* at 6-7 (1968) [hereinafter cited as *Kneese and Bower*]

4. *D.C.C.E.* §1-1303 (1966)

5. *Third Session of Conference* at 1391.

6. *Id*. at 165.

7. *Id*. at 153, 939, and 1173.

8. The Washington Post, July 2, 1970, §A, at 1, Col. 1.

9. *Kneese and Bower* at 284.

10. *Id*. at 237 and 280.

11. *Third Session of Conference* at 1226.

12. Board of Engineers, *Future Water Supply-Facilities-Metropolitan Washington Region-Report No. 2*, at 7-04 (1968) [hereinafter cited as *Board of Engineers.*]

13. Id.

14. Id. at 8-01.

15. V. Bacon, *Findings and Recommendations for Action to Abate Water Pollution in the Washington Metropolitan Area Reach of the Potomac and Tributaries*, at 4 (1970) [hereinafter cited as *Bacon.*]

16. *D.C.C.E*. §§43-1621 to 1624.

17. 31 Fed. Reg. 11857 (1966).

18. A. Wolman and J. Geyer, *Report on Sanitary Sewers and Waste water Disposal in the Washington Metropolitan Region* (1962) [hereinafter cited as *Wolman and Geyer*.]

19. Board of Engineers.

20. Metropolitan Washington Council of Governments, Governments of the Washington Metropolitan Area, at 90 (1968) /hereinafter cited as Governments /.

21. 33 U.S.C.A. §1160(d)(1).

22. Third Session of Conference at 1387-1395.

23. Metcalf & Eddy, Inc., Wastewater Management in the Occoquan Watershed, at 1-1 (April 1970).

24. Id. at 8-10.

25. See Third Session of Conference at 747-756.

26. See Bacon, Table A at 5.

27. The Washington Post, August 7, 1970, §C, at 2, Col. 1.

28. D.C.C.E. §§ 1-1001 (a) and 1002(e)(2).

29. Executive Order No. 11507 (February 4, 1970).

30. See 33 U.S.C.A. §1157(f) and (g).

31. Governments at 85.

32. 35 Fed. Reg. 10756-10757 (1970).

33. U. S. Army Engineer District, Baltimore, Potomac River Basin Report, Vol. I, at 29-32 (1963).

34. Id. at 34.

35. Department of the Interior, The Nation's River 113 (1968) /herein after cited as The Nation's River /.

36. Progress Meeting: Potomac River-Washington Metropolitan Area Enforcement Conference, November 6, 1969, at 165-182 /hereinafter cited as Progress Meeting of Conference /.

37. 42 U.S.C.A. §3102.

38. 42 U.S.C.A. §3335.

39. See Progress Meeting of Conference at 31.

40. *See* *Va. Code Ann.* §§15.1-21, 294, 305, 318, and 320 for counties, cities, and towns: §§15.1-875 and 876 for cities and towns; §15.1-1250(j) for water and sewer authorities; and §21-118.4 for sanitary districts.

41. *Va. Code Ann.* §15.1-1250(k).

42. *Id.* §§15.1-21, 305, and 318.

43. *Id.* §§15.1-294, 320, 875, 876, and 1431(b)(3) and §21-118.4.

44. See Ch. 228 [1959] Md. Acts 292 for WSSC and *Md. Ann. Code* Art. 43, §§650(b)(10) to (12) for county sanitary districts.

45. *See* *Md. Ann. Code* Art. 43, §423.

46. *Md. Ann Code* Art. 43, §674.

47. *D.C.C.E.* §1-817.

48. *Id.* §§43-1530 and 1531.

49. *Id.* §43-1603(e).

50. National Association of Counties/Research Foundation, *Community Action Program for Water Pollution Control*, Community Action Guide No. 2, "Area-wide Approach to Pollution Control Programs," at 30-32 (1967).

51. Virginia Metropolitan Areas Study Commission, *Governing the Virginia Metropolitan Areas: An Assessment*, at 48 (1967).

52. 33 U.S.C.A. §1160(e) to (g).

53. The Washington Post, June 30, 1970, §B, at 2, Col. 8

54. *Board of Engineers* at 8-02.

55. *Id.* at 7-11 to 7-13.

56. *Wolman and Geyer* at Summary and Recommendations (no page numbers in report).

57. B. Frieden, "Providing Urban Services: The Case of Water Supply and Pollution," a report prepared for the U.S. Advisory Commission on Intergovernmental Relations, in *Urban Politics and Problems: A Reader* 247 (H. Mahood and E. Angus, eds. 1969).

58. S. Grava, *Urban Planning Aspects of Water Pollution Control* at 9 (1969).

59. Frieden, *supra* at 243.

60. D.C.C.E. §1-1303.

61. *See* Frieden, *supra* at 241-242; National Association of Counties, *supra* at 33-34; and D. Walker, "Regionalism: Defining the Terms," *Public Management*, April 1970, at 7.

62. U. S. Const., Art. I, §10.

63. 33 U.S.C.A. §1154(a).

64. *D.C.C.E.* §1 1431, Art. III(5)(a).

65. Reorganization Plan No. 3 of 1967, §402(425), Appendix I, Title 1, *D.C.C.E.* (Supp. 1970-1971).

66. Ch. 630, §4, [1964] Va. Acts 934.

67. Ch. 870 §4 [1965] Md. Acts 1418.

68. *See* 33 U.S.C.A. §§1158(a) and (b)(1).

69. R. Davis, *The Range of Choice in Water Management: A Study of Dissolved Oxygen in the Potomac Estuary* at 124 (1968).

70. The Washington Post, June 25, 1970, §A at 26.

71. J. Aron, *The Quest for Regional Cooperation: A Study of the New York Metropolitan Regional Council* at 22, 45, 46, 47, 54, and 58 (1969).

72. *Wash. Code Ann.*, Title 35, Ch. 35.58 (West 1965).

73. Frieden,supra at 258.

74. *Id.*

75. *Minn. Statutes Ann.*, Ch. 473B (Supp. 1970).

76. *Minn. Statutes Ann.*, Ch. 473C (Supp. 1970).

77. Committee for Economic Development, "Reshaping Government in Metropolitan Areas, " at 44-50 (1970).

78. *Id.* at 70.

79 Ch. 84, 11 Stat. 435 (1859)

80 *Board of Engineers* at p. 7-11 to 7-13.

81 The Washington Post, June 25, 1970, §A, at 26.

82 R. Martin, *River Basin Administration* at 332-333 (1960).

83 35 Fed. Reg. 10756-10757 (1970).

84 *The Nation's River* at 19.

85 Public Resolution No. 93, 76th Congress, 54 Stat. 748 (1940).

86 See *Va. Code Ann*. §§62.1-65.

87 U. S. Army Engineer District, Baltimore, *Potomac River Basin Report* (1963)

88 *The Nation's River* at 18.

89 *Id*. at 18-19.

90 Va. Code Ann. §62.1-69.1

91 *Id*. §§15.1-292 and 294

92 *Id*. §15.1-305.

93 *Id*. §15.1-320(1)

94 *Id*. §§15.1-326 to 332.

95 *Id*. §§15.1-341 to 348.

96 *Id*. §15.1-520.

97 *Id*. §§15.1-854 to 856

98 *Id*. §§15.1-875 and 876

99 *Id*. §§15.1-172(h), 175, 178, and 185.

100 The Washington Post, June 24, 1970,§ B, at 3.

101 *Va. Code Ann*. §§15.1-1239 to 1270.

102 Metcalf & Eddy, Inc., *supra* at 2-1.

103 Va. Code Ann. §§15.1-787 & 791.

104 Id. §56-232.

105 Id. §56-265.3.

106 Id. §56-234.

107 Id. §56-235.

108 Id. §56-263.

109 Board of County Supervisors v. Alexandria Water Co., 204 Va. 434, 132 S.E.2d 440 (1963).

110 Potomac News, July 8, 1970, §A, at 8, Col. 1.

111 Va. Code Ann. §§15.1-1400 to 1442.

112 Id. §2.1-63.5.

113 Progress Meeting of Conference at 248.

114 Third Session of Conference at 169.

115 Va. Code Ann. §§21-1 to 21-112.21.

116 33 U.S.C.A. §1151.

117 Metcalf & Eddy, Inc., supra at 1-1.

118 The Washington Post, June 22, 1970, §B, at 1.

119 Id.

120 The Washington Post, August 16, 1970, §D, at 1, Col. 6.

121 Va. Code Ann. §§62.1-44.2 to 44.34.

122 See Va. Code Ann. §62.1-44.15.

123 Metcalf & Eddy, Inc., supra.

124 Va. Code Ann. §62.1-44.18.

125 Id. §62.1-46.

126 Id. §62.1-50.

127 *Id*. §2.1-63.4(c).

128 *Id*. §15.1-1424.

129 *Id*. §2.1-63.6

130 See *Va. Code Ann*. s15.1-1423(11).

131 *Va. Code Ann*. §21-12.1.

132 Virginia Metropolitan Areas Study Commission, *supra* at 46.

133 *Id*. at 52.

134 The Washington Post, June 15, 1970, §B, at 3, Col. 7, and June 24, 1970, §B, at 3.

135 *See* the Washington Post, June 22, 1970, §B, at 1, Col. 4; July 29, 1970, §C, at 1, Col. 3; and September 3, 1970, §B, at 1, Col. 2.

136 Metcalf & Eddy, Inc., *supra* at 1-1.

137 The Washington Post, June 22, 1970, §B, at 1, Col. 4.

138 *Id*.

139 The Washington Post, June 27, 1970, §B, at 7, Col. 1.

140 The Washington Post, July 29, 1970, §C, at 1, Col. 3.

141 The Washington Post, September 3, 1970, §B, at 1, Col. 2.

142 Metcalf & Eddy, Inc., *supra* at 1-1.

143 The Washington Post, June 15, 1970, §B.

144 *Id*.

145 *See* The Washington Post, June 11, 1970, §C, at 6, Col. 1; June 22, 1970, §B, at 1, Col. 4; and July 29, 1970, §C, at 1, Col. 3.

146 *Third Session of Conference* at 1170 and The Washington Post, "Letters to the Editor," June 25, 1970, §A, at 18.

147 The Washington Post, July 4, 1970, §E, at 4, Col. 1.

148 *See* The Washington Post, June 24, 1970, §B, at 3.

149 The Washington Post, June 15, 1970, §B, at 3, Col. 6.

150 Metcalf & Eddy, Inc., *supra* at 1-1.

151 Aron, *supra* at 16.

152 *Va. Code Ann*. §§15.1-1420 to 1441.

153 *Id*. §15.1-1422(b).

154 Ch. 630, (1964) Va. Acts 933.

155 S. Makielski and D. Temple, *Special District Government in Virginia* at 90 (1967).

156 Aron, *supra* at 82.

157 *Va. Code Ann*. §15.1-1425e.

158 *Id*. §15.1-1420.

159 *Id*. §§15.1-1425e and 1426.

160 *Id*. §15.1-1441.

161 *Id*. §§15.1-1239 to 1270.

162 Ch. 407 (1940) Va. Acts 730.

163 *Va. Code Ann*. §§21-141 to 223.

164 Ch. 66, §17 (1960) Va. Acts 76.

165 *Va. Code Ann*. §§21-224 to 290.

166 The Evening Star, August 31, 1970.

167 Va. Code Ann. §15.1-21.

168 *Id*. 15.1-1269.1

169 Fireden, *supra* at 242.

170 *Va. Code Ann*. §§15.1-1400 to 1452.

171 *Md. Ann. Code*, Art. 43, §425.

172 *Id*. Art. 43, §425.

173 *Id*. Art. 43, §442.

174 *Id.* Art. 25, §§52-122.

175 *Id.* Art. 25, §§169-211.

176 *Id.* Art. 25, §§161-167.

177 *Id.* Art. 43, §§445-466.

178 *Id.* Art. 43, §§645-673.

179 *Id.* Art. 43, §387C.

180 Ch. 122 (1918) Md. Acts 248.

181 Ch. 713 (1967) Md. Acts 1558.

182 Ch. 146 (1969) Md. Acts 329.

183 Ch. 122 (1918) Md. Acts 248.

184 Ch. 518 (1920) Md. Acts 1065.

185 *Md. Ann. Code* Art. 66C, §411AD(a).

186 Ch. 122, §5 (1918) Md. Acts 252.

187 Ch. 122, §6 (1918) Md. Acts 253.

188 Ch. 726 (1963) Md. Acts 1515.

189 Ch. 53 (1967) Md. Acts 64.

190 *Md. Ann. Code* Art. 23A, §2.

191 *Id.* Art. 23A, §9(c).

192 *Id.* Art. 43, §427.

193 *Id.* Art. 43, §387C(b)(1)(II).

194 Ch. 700 (1969) Md. Acts 1545.

195 *Md. Ann. Code* Art. 43, §387C(b)(1)(II).

196 *Id.* Art. 43, §387C(d)1.

197 *Id.* Art. 43, §387C(d)3.

198 Hearings Before the Senate Committee on the District of Columbia on Water Pollution in the National Capital Region, 91st Cong., 2d Sess. pt. 1, at 95 (1970) (hereinafter cited as Hearings on Water Pollution).

199 Ch. 653 (1969) Md. Acts 1487.

200 Bacon.

201 Id.

202 Progress Meeting of Conference at 59.

203 See Hearings on Water Pollution at 130-178.

204 Md. Ann. Code Art. 23, §332.

205 Id. Art. 78, §24A.

206 Id. Art. 96, §§89-104.

207 Id. Art. 66C, §§411A-411AD.

208 See Md. Ann. Code Art. 66C, §§88-103.

209 Ch. 448 (1927) Md. Acts 833.

210 Ch. 430 (1957) Md. Acts 610, as amended by Ch. 750 (1967) Md. Acts.

211 Ch. 448, §5 (1927) Md. Acts 839, as amended.

212 Ch. 448, §8 (1927) Md. Acts 841.

213 Ch. 780 (1959) Md. Acts 1210.

214 Hearings on Water Pollution at 122.

215 Md. Ann. Code Art. 43, §§387-427.

216 Md. Ann. Code Art. 43, §617.

217 Ch. 445 (1968) Md. Acts 685, as amended by Ch. 246 (1970) Md. Acts.

218 Md. Ann. Code Art. 96A, §6.

219 Ch. 243 (1970) Md. Acts.

220 Md. Ann. Code Art. 96A, §§ 23-29D.

221 Ch. 240, §1(1) [1970] Md. Acts.

222 *Md. Ann. Code* Art. 88C, §2(b)(4).

223 The Washington Post, June 25, 1970, §B, at 5, Col. 3.

224 The Washington Post, August 7, 1970, §C, at 2, Col. 7.

225 The Washington Post, July 1, 1970, §C, at 3, Col. 1.

226 The Washington Post, July 4, 1970, §E, at 4, Col. 1.

227 The Washington Post, July 13, 1970, §B, at 1, Col. 1.

228 *See* The Washington Post, June 24, 1970, §B, at 2; July 15, 1970, §C, at 4, Col. 1; and August 27, 1970, §B, at 7, Col. 3.

229 The Washington Post, September 19, 1970, §B, at 3, Col. 7.

230 *Md. Ann. Code* Art. 43, §674.

231 Id. Art. 43, §650.

232 Id. Art. 43, §§651 and 665.

233 A. Henbeck, J. Coulter, P. McKee, J. O'Donnell, and D. Pritchard, "Program for Water-Pollution Control in Maryland," *J. San. Eng. Div.*, *ASCE*, April 1968, at 288-289.

234 *D.C.C.E.* §1-101.

235 32 Fed. Reg. 11669 (1967).

236 Resolution of Board of Commissioners, Organization Order No. 141, Appendix III, Title 1, *D.C.C.E.* (Supp. 1970-1971).

237 *D.C.C.E.* §43-1522.

238 *Id.* §43-1540.

239 *Id.* §43-1602.

240 Id. §§43-1541 and 1611.

241 Organization Order No. 141, as amended, Part V. §F, Appendix III, Title 1, *D.C.C.E.* (Supp. 1970-1971).

242 Part II, Organization Order No. 147, Appendix III, Title 1, *D.C.C.E.* (Supp. 1970-1971).

243 *D.C.C.E.* §43-1539(b).

244 Board of Engineers, Table 2.1, at 2-04.

245 *D.C.C.E.* §43-1531.

246 *Id*. §43-1530.

247 Board of Engineers at 3-09.

248 *D.C.C.E.* §1-817.

249 The Washington Post, September 19, 1970, §B, at 3, Col. 7.

250 *D.C.C.E.* §§43-1620 to 1624.

251 N. Jackson, "People, Planning, and the Political Process, "*J. of the Pipeline Div*., *ASCE*, October 1968, at 30.

252 *Third Session of Conference* at 713-714.

253 *See* *Third Session of Conference* at 612-613.

254 *See* *Progress Meeting of Conference* at 111-117.

255 *Progress Meeting of Conference* at 29-30.

256 *Id*. at 30.

257 *Id*. at 112.

APPENDIX B

PAPER P-714

AN ANALYSIS OF ALTERNATIVE INSTITUTIONAL ARRANGEMENTS FOR IMPLEMENTING AN INTEGRATED WATER SUPPLY AND WASTE MANAGEMENT PROGRAM IN THE WASHINGTON METROPOLITAN AREA

Paul S. Hughes

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IDA
INSTITUTE FOR DEFENSE ANALYSES
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SUMMARY

The purpose of this paper is to consider what type of institutional mechanism would be most appropriate for implementing an integrated water supply and waste management program in the Washington metropolitan area. Such a program is defined as one which contains comprehensive planning responsibilities cutting across many services, but which provides wholesale operating capability in the areas of water supply, waste water treatment, and solid waste management.

Institutional criteria developed by various authorities in the fields of environmental management (particularly water resources) and public administration are examined and synthesized. Based on these criteria, which are divided into three categories (i.e., economic, administrative, and political), five existing or proposed institutions are analyzed as to their potential for implementing an integrated water supply and waste management program. The agencies discussed are the Interstate Commission on the Potomac River Basin, the Metropolitan Washington Council of Governments, the Maryland Environmental Service, the Potomac River Basin Commission, and the Metropolitan Washington Waste Management Agency. Of these agencies, the Maryland Environmental Service received the most favorable rating.

Potential institutions, however, need not be limited to existing or proposed agencies. Based on the strengths and inadequacies of the institutions analyzed, a model was developed which attempts to combine these insights with the operational experience of the Twin Cities Metropolitan Council in Minnesota. The resulting structure (which would be permanently created by interstate compact) would be a two-tiered governmental system consisting of a Washington Metropolitan Council and local units of government. The Metro Council would exercise planning, financing, construction, and operation functions on a wholesale basis for water supply, sewage treatment, and solid waste services, and it would have authority to do planning and some financing in the field of air pollution abatement.

The governing board of the Metro Council would consist of 15 members (representing the same 15 local jurisdictions included on the Metropolitan Washington Council of Governments) elected at-large from each of the jurisdictions to serve for six-year overlapping terms. Council decisions would be made by

a 100-vote weighted voting system based on the population residing in each municipality. Official federal, state, and basin-wide interests could be recognized by permitting a representative from each of these jurisdictions to sit on the governing board in a non-voting capacity.

Council authority to implement areawide policies for these services would be delegated to three service districts, i.e., the Northern Virginia Service District, the Washington Suburban Sanitary District, and the District of Columbia, which would have to receive Council approval for any project substantially affecting the metropolitan area. However, local governments would retain control over such non-regional services as water distribution, sewage collection, and refuse collection.

The Metro Council would also be aided by single-service technical advisory boards composed of nine experts from specific fields. These experts would be appointed by the Council to serve part-time for three-year staggered terms, with one representative chosen from Maryland, Virginia, and the District of Columbia each year. The District of Columbia's representation would therefore always constitute one-third of a board's membership in explicit recognition of its unique role as both the state and the central city upon which the rest of the metropolitan area focuses. None of the other municipalities would be permitted to have more than one representative on an advisory board at any given time. Initially, board chairmen would be designated by the Council to serve for three years; subsequent chairmen would be chosen by the boards from their own membership.

No claim is made that the institutional model developed in this paper is the only, or even the best, solution to the problem of regionalizing water supply and waste management services in the Washington metropolitan area. However, to the extent that this study makes a useful contribution to the growing public discussion on how, not whether, such a regional entity should be established, the author's objective will have been achieved.

I

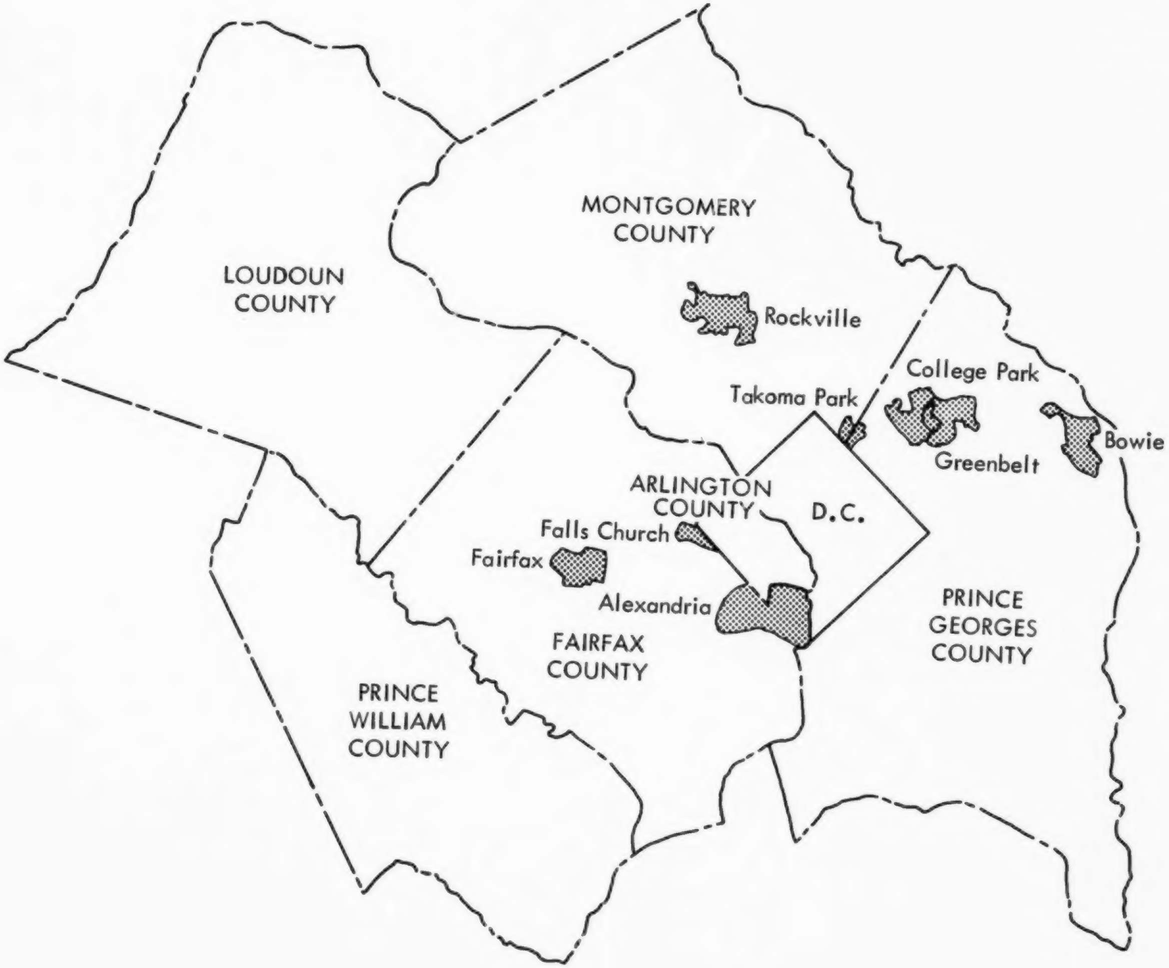
INSTITUTIONAL CRITERIA APPLICABLE TO A METROPOLITAN-WIDE WATER SUPPLY AND WASTE MANAGEMENT PROGRAM SUGGESTED IN SELECTED STUDIES

In recent years a considerable amount of study has been devoted to the economic and technological aspects of environmental management, but relatively little attention has been given to the institutional mechanisms necessary for implementing advances in these areas. Most of the research that has been done in the field of environmental management deals with organizational arrangements for the control of air pollution, the protection of water resources (which includes water supply and sewage treatment services), and the management of solid wastes.

A majority of the studies have concentrated on the water resources management problems of an entire river basin. But because the three environmental fields are so closely interrelated and because the natural planning regions for air pollution and solid waste management rarely encompass an area the size of a river basin, there is need to develop more understanding about the desirable characteristics of less geographically ambitious organizational arrangements. This paper focuses on integrating water supply and waste management programs in the Washington metropolitan area (see Figure 1), examines several existing and proposed institutional arrangements for achieving such integration, and suggests an alternative model.

The first step in developing the model was to examine some of the important institutional research in the environmental field. Much of this work has centered on establishing political, economic, and administrative criteria for the administration of a particular service. A crucial problem from a public administrator's standpoint has been how to reconcile service and function with geographic jurisdiction. To what level of government--federal, state, regional, or local--should the service or function be allocated? Can or should the service (or function) be divided and appropriate portions assigned to different levels of government? What factors should determine the government level to which a particular service (or function) is assigned?

Understanding these issues requires some familiarity with the service responsibilities associated with the successful implementation of a resource management program in each of the three environmental fields. In the water resources field, these include water supply, quality control, flood protection, watershed management (including fish and wildlife protection and soil


LOUDOUN COUNTY
MONTGOMERY COUNTY
Rockville
Takoma Park
College Park
Greenbelt
Bowie
ARLINGTON COUNTY
D.C.
Falls Church
Fairfax
Alexandria
FAIRFAX COUNTY
PRINCE GEORGES COUNTY
PRINCE WILLIAM COUNTY

13-11-71-1

FIGURE 1. Washington Metropolitan Area

conservation), water withdrawals and diversions, hydro-electric power generation, navigation, and recreation development. Solid waste management generally entails collection, storage, transporting, processing, and the disposal or reclamation of domestic, industrial, and agricultural wastes as well as associated regulations, e.g., the prohibition of nonreturnable bottles, and pricing schemes which attempt to influence the kinds, amounts, and timing of waste generation. Air pollution programs consist primarily of enforcing abatement regulations established by state and local governments to control stationary and moving sources of pollution and the prosecution of violators.

Throughout this paper a distinction is made between "service" and "function." "Service" refers to the major aspects of the management of each of the three environmental areas. "Function" refers to the five administrative activities necessary to fulfill these service responsibilities within a given management program, i.e., planning, financing, construction, operation, and regulation. As the rhetorical questions above indicated, both services and functions may be assigned to different levels of government or perhaps even to the private sector, as in the case of an industrial waste reduction program or the operation of a private landfill.

Bearing these issues and distinctions in mind, six studies were surveyed to determine whether there were any similarities in their recommendations. The six studies included were (1) a 1959 Syracuse University study on alternate institutional arrangements for developing the water resources of the Delaware River Basin; (2) an exploration of alternative institutional arrangements for managing river basin operations completed by a 1967 Task Force of the Water Resources Council; (3) a 1968 study on water quality management by Allen V. Kneese and Blair T. Bower of Resources for the Future, Inc.; (4) a paper, prepared in 1970 by Edwin T. Haefele for Resources for the Future, Inc., which explored alternative social choice mechanisms for improving environmental quality; (5) an analysis of water management innovations in England made by Lyle E. Craine in 1969 with support from Resources for the Future, Inc.; and (6) an earlier and broader study done by the Advisory Commission on Intergovernmental Relations entitled Performance of Urban Functions: Local and Areawide.[1] A summary of these studies is given in Appendix A.

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[1] Studies of the Tennessee Valley Authority (TVA) were not included because the special circumstances surrounding its creation in the 1930s were not believed applicable to the Washington area in the 1970s. The TVA experience is considered unique in the development of water resource management capabilities in the United States. Among the unique elements resulting in its formation were (1) the lack of previous attention accorded water (continued)

From these works a list of general institutional criteria began to emerge. For analytical purposes, these were divided into three categories (economic, administrative, and political), although they are not so clearly distinguishable in reality as this trichotomy might suggest. These criteria are shown in Figure 2.

The twelve basic criteria can be used to judge the ability of existing and proposed institutions to implement an effective metropolitan-wide environmental waste management program. Based upon subtle distinctions among the criteria, as outlined in each of the studies, and after interviews with key officials concerned with environmental management problems in the Washington metropolitan area, a more detailed set of criteria was constructed (see Figure 3).

The next step in developing the model was to decide which of the five functions referred to earlier should be included in a metropolitan-wide environmental agency. As shown in Figure 4, it was decided that the agency should be given authority for planning in all four service areas and permitted to become deeply involved in the financing, construction, and operation of water purification, sewage treatment, and solid waste disposal facilities on a regional scale. The implementation of air pollution abatement programs was viewed primarily as a state and local regulatory responsibility which assured public and private compliance with air quality standards. In fact, federal legislation already requires the states to perform the regulatory function with respect to both air and water quality control. Solid waste management was found to be easily divisible between local collection and area-wide waste management systems with the regulatory function best housed with the local jurisdiction in which the wastes are generated.

Recognizing that no single agency is likely to have the responsibility for all of these services and functions or to be able to meet all the criteria outlined in Figure 3, five existing or proposed arrangements that might conceivably be used for implementing a metropolitan-wide integrated water supply and waste

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problems by state and local governments in the Valley; (2) the inability to alter this situation appreciably during the Depression even had the governments involved desired to do so; and (3) the tradition of one-party government that made factional strife rather than party contests based on significant public issues, such as the proposed TVA, the modus operandi. By contrast, the governments of the metropolitan Washington portion of the Potomac Basin are comparatively well organized and are prepared to play an active role in environmental management, although they are understandably protective of services which have been viewed traditionally as lying within their area of responsibility.

CRITERIA	SELECTED STUDIES					
	Syracuse University	Water Resources Council	Kneese & Bower	Haefele	Craine	ACIR
ECONOMIC						
Ability to Internalize Externalities	X		X	X	X	X
Ability to Achieve Economies of Scale						X
ADMINISTRATIVE						
Control of Causal & Affected Areas		X				X
Adaptable Legal & Administrative Authority	X	X	X		X	X
Adequate Financial Authority	X				X	
Ability to Consider Alternatives		X	X		X	
Compatible with Existing Governments	X	X			X	
POLITICAL						
Responsibility for Spectrum of Services	X		X	X		X
Public Accessibility and Accountability	X	X				X
Mechanisms for Citizen Participation	X		X			X
Attract Two-Party Interest	X	X		X		
Promote Consensus Among Decisionmakers				X		

FIGURE 2. Criteria Suggested In Selected Studies

ECONOMIC	ADMINISTRATIVE	POLITICAL
1. Territorial jurisdiction sufficient to internalize externalities ● Contain natural planning regions for all resources ● Enforcement of resource standards at jurisdictional entry points 2. Territorial jurisdiction and population density sufficient to realize economies of scale ● Achievement of lower per unit costs within a resource management sector ● Achievement of lower per unit costs across resource sectors	1. Geographic jurisdiction adequate for achieving effective political control over causal and affected areas ● Inclusive of all affected governmental jurisdictions in their entirety 2. Adaptable legal and administrative authority ● Planning, financing, construction, operating and regulatory powers commensurate with responsibilities ● Focus of organizational responsibility ● Clear channels of organizational authority ● Manageable span of control ● Independence in allocating internal resources ● Ability to assume or shed services and functions ● Areal and temporal flexibility 3. Adequate financial authority ● Ability to issue general obligation and revenue bonds ● Power to levy ad valorum taxes and user charges ● Authority to create special taxing districts ● Authority to use "piggyback" taxes ● Independent financing capabilities 4. Ability to consider alternative goals and approaches ● Consider service areas for which it does not have direct control ● Review, comment, and (in some cases) approval powers ● Adequate staff to perform analyses 5. Structural compatibility with existing governments ● Does not duplicate services being effectively administered ● Compatible with federal system ● Employ two-tier division of responsibilities within and between services and functions	1. Responsibility for spectrum of services to maximize trade-offs among needs and resources ● Suffiently heterogeneous population ● Responsibility for multiple services amenable to user charge financing ● Power to implement comprehensive plans 2. Accessible and accountable to those affected by its decisions ● Degree of decentralization ● Method of electing policymakers ● Visibility of decisionmakers ● Interests outside the metropolitan area should not be represented 3. Mechanisms for eliciting citizen participation ● Cross sectional population base ● Specific structural mechanisms at critical decision-making points 4. Attract two-party interest in its affairs ● Multiservice responsibilities ● Partisanship, timing, and geographic basis for elections ● Length of terms and emoluments of office ● Prestige and opportunity for public exposure 5. Promote consensus among its decisionmakers ● Governing body of small size ● Institutional security for representatives ● Overlapping terms of decisionmakers ● Open or closed manner of reaching policy decisions ● Geographic and minority representation

* See Appendix B for detailed discussion of criteria.

FIGURE 3. Synthesis of Areawide Institutional Criteria

management program in the near future were analyzed. From this exercise insights were gained which contributed to the formulation of the institutional model described in Section III.

Functions	SERVICES			
	Air	Water Supply	Sewage	Solid Waste
Planning	X	X	X	X
Finance	X*	X	X	X
Construction		X	X	X
Operation		X	X	X
Regulatory				

*May assist local units in purchasing monitoring equipment.

FIGURE 4. Services and Functions of Model Areawide Water Supply and Waste Management Agency

II

POTENTIAL INSTITUTIONAL MECHANISMS FOR ADMINISTERING AN INTEGRATED WATER SUPPLY AND WASTE MANAGEMENT PROGRAM IN THE WASHINGTON METROPOLITAN AREA

There are several organizational arrangements in the Washington metropolitan area which have the potential for implementing an integrated water supply and waste management program. The three that are already operable are the Interstate Commission on the Potomac River Basin (INCOPOT), created in 1940; the Metropolitan Washington Council of Governments (MWCOG), formed in 1957; and the Maryland Environmental Service (MES), which began operations in mid-1970. Two others, which are not yet activated, are the federal-interstate Potomac River Basin Commission (PRBC), which was proposed in October 1968, and the Metropolitan Washington Waste Management Agency (MWWMA), which has existed on paper since late 1967 and which would function under the auspices of the MWCOG.

The following discussion of each organization is broken down into two parts. The first describes the agency's responsibilities and powers, and the second analyzes its attributes in relation to the institutional criteria shown in Figure 3. Based on this analysis, the five organizations are ranked as to their ability to administer a metropolitan-wide water supply and waste management program.

A. INTERSTATE COMMISSION ON THE POTOMAC RIVER BASIN

1. Description

The INCOPOT was established by an interstate compact among the District of Columbia and the states of West Virginia, Pennsylvania, Maryland, and Virginia for the purpose of regulating, controlling, preventing, and treating pollution in the Potomac River Basin. The 18-member Commission consists of three representatives from each of the five signatory governments and three members appointed by the President of the United States. It is authorized to do the following:

- Collect and analyze data on the sources and effects of pollution.

- Disseminate information to the public regarding its findings.

- Assist other public and private agencies in formulating and coordinating water pollution abatement plans.

- Sponsor cooperative action in connection with these plans.

- Comment on the plans of public or private agencies affecting the pollution or development of the Potomac River.

- Recommend minimum standards for water quality and sewage treatment to the member governments.

- Cooperate with legislative and administrative agencies of the signatory bodies to promote uniform laws and regulations regarding pollution abatement and water resources development in the basin.

The Commission cannot compel a member government to accept its recommended standards and must rely entirely upon the appropriate water pollution control agencies to enforce the standards if they are set. However, even these recommendations must have the approval of at least two of the three commissioners from the affected jurisdiction.

Commission revenues come primarily from three sources--federal government contributions, appropriations by the legislative bodies of each of the signatories, and Environmental Protection Agency (EPA) grants. The terms of the original compact placed a ceiling of $30,000 on the combined annual contribution of the signatories. Although the federal government is not a signatory bound by this limitation, its direct contributions in recent years have not exceeded $5,000 annually. In FY 1968 INCOPOT's budget was approximately $75,000; a grant allocated under Section 7 of the Federal Water Pollution Control Act accounted for $39,000 of the total.

A compact amendment enacted in September 1970 removed the $30,000 ceiling on combined contributions and the signatories have indicated that they will increase their combined contribution to $87,000. Recent discussions with federal officials suggest that INCOPOT's share of Section 7 funds for FY 1972 will be $51,200. With these increased contributions and an anticipated direct federal contribution of $20,000, INCOPOT would have a $158,000 operating budget for FY 1972. A full-time executive director and two clerical assistants constitute the present INCOPOT staff. The increased funding would permit the size of the staff to be doubled with positions equally divided between professional and clerical personnel.

Other amendments proposed by the signatories and recently approved by Congress would broaden the scope of INCOPOT's authority to include water resources and associated land resources in addition to water pollution abatement, allow the Commission to provide liaison among public and private agencies in the formulation and coordination of plans relating to the development of water and associated land resources in the basin, and allow the Commission to establish "sections" to deal with problems of pollution and of water and associated land resources in specific areas which directly affect two or more signatories.

The stated purpose for continuing the existing compact, with the above amendments, was to provide an interim working organization until the proposed Potomac River Basin Compact is approved by the states and Congress.[1] As a temporary body, INCOPOT has not been given serious consideration as an agency capable of implementing long-term programs on either a basin-wide or a metropolitan-wide basis.

2. Analysis

The recent amendment which gave INCOPOT authority over water resources and associated land resources recognizes that land-use activities have a major impact on water pollution through soil erosion, increased storm-water runoff, and seepage of agricultural and domestic fertilizers. As far as the economic criteria listed in Figure 3 are concerned, INCOPOT remains essentially a single-purpose agency with its concerns specifically limited to the natural planning region (i.e., the Potomac Basin) for the resource over which it has some responsibilities. However, it cannot itself take advantage of economies of scale which it might deem worthwhile because its responsibilities are limited to providing advice, gathering and analyzing data, and disseminating information to the public, and they do not extend to the direct operation of pollution abatement projects.

When considered against the administrative criteria, INCOPOT fares rather poorly. Although the governments represented in its membership exercise jurisdiction over the causal and affected areas of the Potomac River, INCOPOT must rely on its signatories to implement or enforce its recommendations voluntarily. Moreover,

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[1] See discussion by the House of Representatives regarding the recently enacted amendments to the compact creating the Potomac Valley Conservancy District and establishing the Interstate Commission on the Potomac River Basin, Congressional Record, House, September 14, 1970, p. 8617; and Potomac River Basin Compact, Article 15, Section 15.15, The Potomac River Basin Advisory Committee (Washington, D.C., October 1968).

INCOPOT has no authority to undertake any of the five functions normally associated with an areawide waste management program.

There obviously can be little unity of command or central focus in policymaking when the three representatives from each of the five signatory governments are usually department heads for whom the appointment is of secondary importance. Commission meetings are held only periodically and the executive director is permitted wide latitude in discharging the Commission's responsibilities during interim periods. The question of administrative span of control does not arise because of the small staff. The Commission is free to allocate both its financial and personnel resources as it wishes, but neither of these resources has been of sufficient magnitude in recent years to constitute a significant problem.

The responsibilities of INCOPOT have been broadened by the recent amendment adding "associated land resources" to its concerns. Areal flexibility presents no problem, since INCOPOT's boundaries already include the entire drainage basin. The Commission continues to possess temporal flexibility (at least in theory) but in reality it is viewed merely as a temporary agency whose functions and staff will be assumed by the Potomac River Basin Commission once it is established.

Despite a recent amendment, INCOPOT is still dependent upon five different appropriation processes for two-thirds of its budget; the other third is contributed by the federal government through three separate appropriations. Another amendment allowing the Commission to establish "sections" for the purpose of "dealing with problems of pollution and of water and associated land resources in specific areas which directly affect two or more ... signatory bodies" is stated broadly enough to permit the creation of districts from which special assessments could be collected to finance specific projects. Whether this was the actual intention of the amendment, or whether INCOPOT will choose to interpret it in this manner, is open to speculation.

INCOPOT presently considers alternative goals and approaches to river basin development (over which it has no direct control) by receiving testimony from interested basin residents, by commenting on proposed plans and projects, by participating in enforcement conferences, and by providing coordinative and liaison functions on issues in which it is interested. This work is done primarily by the executive director since the commissioners serve only on a parttime basis and owe primary allegiance to their respective governments whose policies are often in conflict with those of INCOPOT.

Although it is the only agency concerned with the total basin, INCOPOT is structurally compatible with existing governmental units since it does not usurp any of their powers and is legally considered an agency of each signatory. Because its functions are strictly advisory, INCOPOT is not viewed as a threat by other state or local agencies, and they are free to ignore its recommendations if they choose.

As far as political criteria are concerned, the recent amendment giving it new authority over "associated land resources" has increased the spectrum of services over which INCOPOT has advisory powers. Since the PRBC, should it be created, will have somewhat broader responsibilities in the water resources sector, a much firmer financial base, and ultimate authority to approve zoning and land-use controls within an established "river zone," it appears that INCOPOT may be broadening its scope to closely parallel that proposed for the PRBC in order to smooth the period of transition or to continue its activities if the formation of the PRBC is delayed or permanently defeated.

Admittedly, the Commission's decisions are somewhat removed from public view, since its members are accountable only to the appointing authority in their respective jurisdictions. The fact that most of the Commission's deliberations take place outside the public view, however, undoubtedly facilitates agreement among the members within the range of INCOPOT's limited authority. With the offices of INCOPOT's three-man staff located in the District of Columbia, access to the Commission and its executive director is more readily available to Washington metropolitan residents than to those residing in the upper portions of the basin. But it also means that INCOPOT's staff is located at the center of the basin's most populated area and in proximity to Congress and the federal agencies with which it must work. Although neither the scope of its services nor the size of its staff justifies the establishment of sub-regional offices in the basin, INCOPOT has been relatively successful in decentralizing its operations by holding periodic public meetings and informational conferences at various locations throughout the basin. This effort has lessened the communication difficulties which might have been experienced by a small agency responsible for a 14,000 square mile area.

Since INCOPOT is not empowered to levy taxes, there is no political reason why it should be an elective rather than an appointive body. Moreover, the fact that commissioners with similar backgrounds and responsibilities are appointed from constituent units may be more conducive to cooperation within INCOPOT's limited range of authority. However, it must be conceded that self-government for the Washington metropolitan area is not furthered when the appointed commissioners represent interests and geographical areas larger than those of the Washington metropolitan area.

INCOPOT has been successful in encouraging active citizen participation. As was mentioned, periodic meetings are held at various locations throughout the basin on matters related to the Commission's responsibilities. Technical matters are clarified for interested lay groups and citizens' views on basin matters fully heard. An informal, two-step hearing process has evolved; matters such as the proposed Potomac River Basin Compact are discussed in their formative stages and later before a final decision is made. However, the Commission has neither the resources nor staff to support a permanent basin-wide citizen advisory panel.

None of the factors which would encourage two-party interest in INCOPOT's activities appear to be present: the Commission's focus is on one resource; there is little prestige, public exposure, or pecuniary reward associated with Commission membership; and Commission members are appointed by, and usually serve at the pleasure of, chief executives responsible to a much larger constituency. Factors tending to promote a consensus among the members of the Commission include its relatively small size, overlapping terms, and meetings held outside the glare of publicity.

To summarize, INCOPOT is an advisory agency responsible for only one resource area, it lacks operational and enforcement powers, and it is entirely dependent for its support upon the voluntary financial contributions of the signatory governments and the federal government. But within the limits of its advisory and coordinative authority it makes a creditable effort to examine alternative goals and approaches, to make them known to interested parties, and to maintain close liaison with citizens' groups throughout the basin. INCOPOT appears to be structured so as to facilitate consensus among the members of its governing body.

B. METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS

1. Description

The Metropolitan Washington Council of Governments (MWCOG) is the third oldest such council in the United States. Initially called the Washington Metropolitan Regional Conference when it was formed in 1957, it remained an informal group of metropolitan officials until it incorporated as a non-profit organization in 1965. Under provisions of its charter the new corporation, MWCOG, was granted the power of perpetual succession. Stimulus for the incorporation of MWCOG came from the passage of the Federal Highway Act of 1962 and the Housing and Urban Development Act of 1965 which, respectively, required areawide planning as a precondition for receiving highway funds and made regional councils of government composed of locally elected officials eligible for receipt of federal grants for metropolitan planning. Its importance was further enhanced by Section 204 of the Demonstration Cities and Metropolitan Development Act of 1966, which required that all local government applications for federal grants and loans for 30 specified programs must be reviewed by an organization responsible for metropolitan planning. Since that time some 25 programs have been added to the original list by Executive Orders.[2]

Fifteen major local governments--the District of Columbia, three Maryland and three Virginia counties, and eight cities--are represented on the MWCOG. The general membership (175 persons) includes all elected officials of the 14 counties and cities; the District of Columbia mayor, deputy mayor and the city councilmen (all of whom are appointed by the President); Maryland and Virginia state legislators and congressmen who represent districts in their states that fall within MWCOG's jurisdiction; and all the members of the District committees of both houses of Congress, until such time as the District of Columbia is given Congressional representation. In addition, three liaison officers, appointed by the two state governors and the President, attend the general meetings as observers.

The business of MWCOG is conducted on two levels. The general membership meets annually to approve the program and budget for the coming year; the board of directors, which is responsible for carrying out policies set by the general membership, meets monthly. Terms of office of the general membership and the board of directors coincide with their terms in the respective jurisdictions which they represent.

There are 19 members on the board of directors: one member selected by each of the Maryland and Virginia local governments; two from the District of Columbia, which is counted as a city and a county and is therefore entitled to two seats; one member each from the Virginia and Maryland legislatures; and one member from either the Senate or House District committees. The board of directors is charged with preparing policy recommendations for the general membership, making interim budgetary and program decisions, and generally acting on behalf of the entire organization between annual meetings. The board is aided in making its decisions by five policy committees chosen from the general membership and by 18 technical committees composed of professional staff drawn from MWCOG and its participating jurisdictions. Although ultimately dependent on the general membership for approval of its actions, the board's decisions are rarely, if ever, reversed.

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[2] See Bureau of the Budget Circular A-95, dated July 24, 1969.

Under the provisions of its charter, MWCOG is empowered to advise and assist the local governments of the region and (a) to identify mutual areawide problems, (b) to develop and promote a comprehensive regional plan, (c) to seek mutually desirable policies and develop cooperative mechanisms among the local governments, (d) to support and promote concerted action among the local governments for their mutual benefit, and (e) to serve upon request of a local government as its representative in matters of regional concern. The Council does not have authority to legislate, regulate, enforce, or tax, and member governments can oppose any proposal or withdraw from MWCOG whenever they choose. Moreover, the fact that a representative from a given community votes in favor of a proposed Council action in no way obligates his community to follow his lead.

MWCOG has been active in all the environmental areas associated with an integrated water supply and waste management program. It has established approximately a dozen air monitoring stations and an air-testing laboratory where the region's air is analyzed daily. In 1966 MWCOG submitted a model air pollution ordinance to the 15 local jurisdictions, all of whom have now adopted ordinances based on the Council's model. In 1967 a Council-sponsored study of the region's water supply needs recommended the construction of reservoirs as the best means to augment the flow of the Potomac River. Another study completed in 1967 outlined a detailed program under which each jurisdiction could meet its solid waste disposal needs through 1985. The report suggested that each municipality be responsible for its own refuse disposal and recommended that a regional solid waste authority be established to deal with problems that could not be resolved locally.

During fiscal 1969, the MWCOG budget of $2.1 million supported a permanent staff of 96, including 48 professionals. Assessments for all participating governments are fixed at the annual general membership meeting in amounts sufficient to provide funds for the adopted budget. The most recent bylaws of MWCOG state that the annual assessment shall be primarily on a per capita basis, determined by the most recent population estimates furnished by the regional and local planning agencies.

Of the $2.1 million, $1.5 million (70 percent) came from federal grants, primarily from the Department of Housing and Urban Development. This degree of dependency on federal funds has caused concern among some MWCOG officials who question whether regional organizations are becoming "arms of the federal government."[3] There is a growing feeling that the potential of MWCOG (or any voluntary council of government) is limited because of the fact that the federal grants are categorical grants which distort local and metropolitan priorities, that the studies which they finance are relatively noncontroversial, and that decisions based on the results of these studies are likely to be the lowest common denominator necessary to achieve consensus among the membership.

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[3] "Chairman Urges Assessment of COG's Future Status," National Civic Review, March 1970, p. 158.

2. Analysis

The MWCOG is active in all three environmental areas associated with an integrated water supply and waste management program. The Council does not have jurisdiction over the entire airshed encompassing the Washington metropolitan area, but the area in which motor vehicular traffic produces 70 percent of the air pollution in the Washington metropolitan area does fall within its jurisdiction.[4] Because most of the solid wastes are generated near the center of the metropolitan area, it could generally be agreed that, except for areas located at the extreme edges of MWCOG's jurisdiction, or for proposals to transport solid refuse by barge or rail to disposal sites outside the metropolitan area, MWCOG encompasses the natural planning area necessary for a solid waste management program.

However, MWCOG's boundaries do not encompass the natural drainage area necessary for overall water resources planning and development. If MWCOG were permitted to levy effluent charges on upstream users for costs which they impose on residents of the Washington metropolitan area, an argument could be made that MWCOG had sufficient jurisdiction to internalize externalities associated with water use. But this is not true today.

MWCOG is limited by its charter to advising and assisting local governments of the region on areawide matters. Although the charter does give it authority to represent local governments on matters of regional concern upon their request, this authority has not been interpreted broadly enough to permit MWCOG to engage in the direct operation of regional facilities. As a result, MWCOG is not in a position to take advantage of certain economies of scale through regionalization, although it can and does encourage such economies through its comprehensive planning and advisory roles.

MWCOG has no political control over local governments whose jurisdictions include the causal and affected areas of the three environmental resources, although its membership includes the 15 major governmental units in the metropolitan area, which encompass the full range of environmental pollution problems. However, the very nature of MWCOG's voluntary membership means that a representative from one of these units cannot commit his community to a course of action by his vote at either the general membership or board of directors' meetings. Because each member government is free to withdraw at any time, as Montgomery County temporarily did in the early 1960s, it can hardly be said MWCOG possesses effective political control over the causal and affected areas regarding any metropolitan service, including the three environmental services.

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[4] The Metropolitan Washington Coalition for Clean Air, as cited in The Potomac Newsletter, Potomac Basin Center, September 25, 1970, Vol. IV, No. 9, p. 7.

Of the five functions (i.e., planning, financing, construction, operation, and regulation) associated with the implementation of an integrated environmental program, MWCOG only has expressed powers to develop and promote a comprehensive regional plan. It might appear that two of its other powers (i.e., to support and promote concerted action among the local governments for their mutual benefit, and to serve upon request of the local governments as their representative in matters of regional concern) could be interpreted with sufficient latitude to permit some programmatic initiatives by the Council with minimal local encouragement. But because the provision of certain regional services has become institutionalized through intergovernmental agreements (e.g., capacity rights at the Blue Plains Treatment Plant), and because strong political forces have developed with access to key decision-making points under existing institutional arrangements, it seems doubtful that those forces would be willing to alter the current arrangements unless they could see some opportunity to advance their own interests.

Focusing responsibility is admittedly a problem because the policy-making functions of MWCOG are divided between the board of directors and the general membership. Administratively, the professional staff is divided into eight departments, each reporting to the executive director. This arrangement clearly focuses responsibility internally and does not appear to be an overburdensome arrangement for the executive director. Since the governing body of MWCOG (i.e., the general membership) represents constituent units which collectively determine its budget and authorize expansion of its services, functions, and areal boundaries, the MWCOG cannot claim legal or administrative autonomy over its own affairs.

Operating revenues are drawn primarily from two sources--federal grants and an annual assessment of member governments. Because of the categorical nature of most federal grants, MWCOG's choice of study areas has been limited to those for which funds were available rather than those which might otherwise command a higher metropolitan priority. Moreover, with the remainder of its budget subject to the willingness of member governments to pay their annual assessment, MWCOG's flexibility in making recommendations on controversial subjects affecting these governments is necessarily constrained.

Perhaps the most useful role which MWCOG can and does play is the recommendation of alternative metropolitan goals and approaches for the many services with which it is concerned. The development of a comprehensive metropolitan plan is one example of this. Another is MWCOG's role in reviewing and commenting on loan and grant applications submitted by local governments to federal agencies. This does not mean that MWCOG has a veto over these applications, nor does it mean the federal agency responsible for approving the application is bound to accept MWCOG's recommendation on the conformance of the proposal to existing metropolitan plans. In practice, certain federal agencies (e.g., the Department of Housing and Urban Development) give more weight to the Council's recommendations in approving applications than do other departments. Seldom, however, do purely local decisions which do not involve the use of federal monies, but which perhaps have metropolitan implications, come before MWCOG for its comments and recommendations, and under no circumstances would the sponsoring government be bound by them.

As far as being structurally compatible with the existing governmental units, MWCOG does not duplicate the services or functions of any existing agencies concerned with the three resource sectors under consideration. In fact, it is the only agency responsible for looking at the entire metropolitan area from a multiservice standpoint. As with INCOPOT, the fact that MWCOG is primarily an advisory body means that it poses no immediate threat to existing agencies which may fear a loss or restriction of their operating or enforcement authority. MWCOG is compatible with the federal system, as witness the support for its creation and continued operation by the major local governments and the federal government. The Council embodies the "two-tier" concept of government which places overall responsibility for policy matters at one level of government and day-to-day administrative responsibilities at a lower level (in this case with the local jurisdictions).

Cooperation of the states, which is of paramount importance in an interstate metropolitan area, has been achieved by means of state liaison officers who attend MWCOG meetings, as observers, on issues in which the states are interested. Direct state involvement has also been realized by including in the general membership those legislators who represent the districts of Virginia and Maryland that lie within MWCOG's boundaries. However, no direct financial assistance has been forthcoming from either state to date.

There can be no argument that MWCOG is involved with most of the problems which confront the metropolitan area. To say that it has the ability to consider a broad spectrum of services, however, is not to say that it has the authority to balance various governmental needs and resources and to make decisions on the most optimal mix of public expenditures within the metropolitan area. In fact, MWCOG has little but the creditability of its studies and the cogency of its arguments to influence the outcome of various local decisions.

Constituent unit representation may facilitate cooperation among the member governments but the advantage of direct visibility and accountability to the citizens is lost. This is not to say that constituent unit representation is not appropriate while MWCOG is still basically a planning and advisory body with no powers of taxation. New procedures for selecting its policy-making body through direct election would seem appropriate if MWCOG were to assume additional functional responsibilities within specific service areas and be granted the power to levy service charges, to create special assessment districts, or to levy taxes. At present political accountability of MWCOG to the citizens of the metropolitan area can be best described as indirect and weak.

Much of the outside advice considered in the MWCOG decision-making process comes from the numerous technical committees composed of professional staff from member governments. Public hearings and meetings are held prior to the submission of its recommendations on new federal applications and on other matters which it deems of importance. There is a formal procedure for channeling citizen grievances through the governing bodies of the member governments and their representatives to MWCOG. Nevertheless, informal complaints are often received by the MWCOG staff and these may have some effect on the recommendations which it makes to the board of directors.

It cannot be said that MWCOG has sufficient authority in each of its service areas to command an active two-party interest in its affairs. However, MWCOG does embrace a broad range of services which has attracted the interest of locally elected officials. Because it provides a "school" for aspiring politicians who can become well grounded in metropolitan problems, and because it provides a forum in which they can speak out on various issues, MWCOG constitutes an ideal base from which to launch a career for higher elected office. In this regard the prestige and opportunities for public exposure more than offset the lack of financial incentives, real job security, and meaningful operational authority that could be utilized to benefit the officeholder's constituents.

Given the fact that the board of directors has been delegated responsibility for overseeing day-to-day operations of the MWCOG staff, it is important to understand some of the conditions that facilitate consensus among its members. These include its small size, as compared to MWCOG's total general membership; its use of working committees formed from the general membership to advise it on policy matters; the significant role played by the central city, which is entitled to two of the 19 seats on the board of directors; and its consideration of minority interests by the requirement that two representatives from Maryland, two from Virginia, and one from the District of Columbia be present before business can be conducted.

The fact that a small group conducting a good deal of its work outside the glare of publicity is conducive to producing a consensus is not new. Neither is a provision that metropolitan minority interests be given additional protection by the requirement that an extraordinary majority (i.e., three-fourths) "be present and voting" to amend the bylaws under which the board operates. However, the role accorded the central city requires elaboration. First, according to MWCOG's bylaws the District of Columbia is recognized as both a city and county and is therefore the only governmental unit that has two votes on the board of directors. Second, because of the requirement that a representative of the District of Columbia be present to constitute a quorum, the District is the only local government that could unilaterally prohibit the conduct of the board's business. Third, once a quorum is present, a little-used system of weighted voting can be invoked which gives each participating government one vote for each 25,000 residents it represents. The latter situation means that the District government would have the largest block of votes on controversial issues upon which all suburban interests were not aligned.

The pivotal role of the District government is stressed to point up the impact of the central city in regional affairs. For instance, the Blue Plains sewage treatment plant located in the District of Columbia is the largest sewage treatment facility in the area; the water treatment and distribution system, owned and operated by the Army Corps of Engineers, that serves the District and adjacent municipalities is likewise the most extensive in the metropolitan area; and the District also generates the most air pollution and solid waste of any jurisdiction in the metropolitan area. Thus, the pervasive influence of the District in metropolitan affairs must be recognized in any metropolitan-wide agency, as evidenced by MWCOG's quorum requirements for its board of directors, and the fact that a District of Columbia member has chaired the board on at least three occasions.

C. MARYLAND ENVIRONMENTAL SERVICE

1. Description

The Maryland Environmental Service (MES), which became operational on July 1, 1970, was created by state statute and given perpetual existence. Its purpose is to provide a state-wide mechanism for dependable, effective, and efficient purification and disposal of liquid and solid wastes. The Service is an instrument of the state and operates along with the Department of Water Resources within the Department of Natural Resources.

The Service has three officers--a director, secretary, and treasurer--who constitute its board of directors and who are appointed, with the approval of the governor, by the Secretary of the Department of Natural Resources and serve at his pleasure. The primary purpose of this three-man body is to approve the issuance of MES revenue bonds. The director presides over the board, is administrative head of MES, and is responsible for day-to-day operations.

The Secretary of Natural Resources retains the right to approve the policies and procedures of the Service, but he may not transfer MES functions, staff, or funds. However, as long as the Service is dependent on the state general fund for financing all or part of its operations, the Secretary has the authority to set personnel ceilings and approve budget expenditures.

The Service is essentially a state-wide wholesale sanitary district with extensive powers to accept water and solid wastes from subordinate jurisdictions. These operating powers include the authority to:

- Plan, integrate, and establish planning service regions and financing districts (which need not necessarily coincide geographically) for waste water purification and solid waste disposal.
- Do research and development on improved methods of liquid and solid waste acquisition, transportation, processing, purification, disposal and management, and provide technical consultation to appropriate municipalities based on these and other findings.
- Acquire (through the right of eminent domain), construct, reconstruct, improve, operate, and maintain waste water purification and solid waste disposal projects within or without the State of Maryland.
- Borrow money and issue revenue bonds to finance its projects.

- Fix, alter, and collect rates, fees, and charges for the use of services furnished by its projects (subject to Public Service Commission and Circuit Court appeals).

- Enter into contracts relating to the provision of its services and facilities with the federal government, other state agencies or subdivisions, or other municipalities lying in adjoining states.

- Make application for and receive grants from any state or the federal government for the purpose of discharging its responsibilities.

- Conduct hearings and investigations pertaining to any of these powers.

The creation of subordinate service regions is a key factor in implementing MES programs. The service regions are determined by the Service Director after consultation with the Secretary of Natural Resources, the Secretary of State Planning, the Secretary of Health and Mental Hygiene, and the affected municipalities. The regions designated for the liquid and solid waste treatment systems need not be identical. Based on the need, as identified in the state-approved, 10-year county master plans for water and sewerage or solid waste management, MES then prepares a five-year plan for each service region. The latter plan outlines the most effective means for providing waste water purification and solid waste disposal projects in the region, designates the facilities to be transferred to the Service, and indicates where new facilities are to be located and how they are to be financed. The MES plan requires approval by each of the counties (or the City of Baltimore) before it can be adopted by the Service.

A municipality may, at any time, request the Service to provide waste water purification or solid waste disposal projects, and, unless it certifies that it is unable to accept this responsibility, the Service is required to draft a contract for providing those services immediately. If a contract is consummated, the municipality is charged on the basis of the volume and characteristics of the wastes processed. In the event the municipality is unable or refuses to pay the Service its specified charges, state funds derived from various state-shared taxes (excluding sales) which were to be distributed to the municipality will be paid directly to the MES until the debt is repaid.

The MES is also required to provide projects in two other instances. First, the Secretary of Health and Mental Hygiene can direct the Service to install or operate sewerage or refuse disposal facilities when (a) a municipality fails to comply with his order to provide such facilities, (b) an individual or firm fails to comply with his order to abate pollution, (c) a municipality, individual, or firm fails to comply with his order to correct deficiencies in the operation of such facilities, or (d) a municipality, individual, or firm fails to extend or alter such facilities. Second, if an individual or firms fails to comply with an order of the Department of Water Resources to abate pollution, the Secretary of Natural Resources can direct the Service to provide the necessary project. In each instance the costs incurred in constructing, operating, or assuming the facilities are borne solely by the municipality, individual, or firm against whom the order was issued.

The MES has absolute discretion in determining the type of revenue bonds it issues, within certain general limitations applicable to all state agencies. However, the bonds do not carry the full faith and credit of the state, but neither are they subject to federal, state, or local taxes.

The Service is empowered to enforce rules and regulations necessary for administering its internal affairs and for the use and operation of its projects, subject to the condition that its projects do not conflict with those of the State Department of Health and Mental Hygiene. The MES may limit and regulate (including requiring pre-treatment) liquid waste, refuse collection and disposal, and storm and surface water drainage service on a temporary basis in any area served by its projects. Moreover, within a Service district no municipality, individual, or firm may discharge liquid wastes except through projects of the Service or projects of a municipality or firm designated in the MES five-year plan, or under conditions which the Service might stipulate. It is unlawful for a municipality, individual, or firm to duplicate or use facilities similar to those made available by the Service, and any violation of these, or other rules and regulations promulgated by the Service, carries a maximum fine of $1000 for each violation--with each day constituting a separate violation.

The legislation creating the MES contains specific provisions protecting the autonomy of subordinate instrumentalities of the state. Perhaps the most important of these is the requirement that the Service adopt its five-year plan for a given region only after at least one public hearing has been held in each of the affected counties and after the plan has been approved by the governing bodies of those counties. Should the plan not receive the required approvals within four months, only a joint resolution of the Maryland General Assembly can authorize adoption of the plan.

The legislation also specifically states that, unless it gains the municipality's consent, the MES does not have the authority to interfere with or restrict the operation of existing projects which the Secretary of Health and Mental Hygiene determines are being adequately administered by the responsible municipality. Further, the construction of new solid waste disposal projects by the Service is expressly prohibited without the consent of the governing body of the municipality concerned. Finally, under no circumstances are the zoning and land-use planning functions of municipalities to be usurped by MES plans.

Since it has only been in existence since July 1970, the MES is still taking on staff to meet its responsibilities. Initially, the Service will concentrate on waste water treatment because previous state legislation requires that comprehensive county plans for water and sewer services be completed by 1970 and that similar plans for solid wastes management be submitted by January 1, 1974.

The Service is already involved in planning, preparation for direct operations, and preliminary legal, engineering, and design activities. These efforts are focusing on state-owned facilities, on modifying and implementing approved county water and sewage plans, and on solid waste management demonstrations.

2. Analysis

Because the MES has been in existence only a short time, it is too early to judge the adequacies of its organizational structure from an operational standpoint. However, an assessment is made here of its potential capabilities on the basis of its enabling legislation and interviews with some of its officials. The enabling legislation specifically limits MES authority to purification and disposal of liquid and solid wastes; water supply services cannot be included in this category unless they involve recycling of liquid waste water to obtain potable water.

For the two service areas over which it has administrative authority, the MES has sufficient territorial jurisdiction to internalize the externalities for solid wastes but only partially for waste water. Under an interstate agreement (the Arbitration Award of 1877), Maryland has control over the Potomac River--except for the portion flowing past the District of Columbia--to the high-water mark on the Virginia side for that segment of the river forming a boundary between the two states. Although a system of effluent charges might be useful in dealing with upstream pollution, MES is not empowered to levy charges unless the Service has a contract with the offending upstream state or municipality. Therefore, short of the State of Maryland's suing the responsible jurisdiction, the Service's hands appear to be tied. However, in regard to solid wastes, except for proposals to haul refuse by rail or barge to other states, the Environmental Service does include the natural planning boundaries for solid waste generation and disposal within its purview.

The Environmental Service, as a state-wide wholesale sanitary district, possesses sufficient territorial jurisdiction and encompasses areas of sufficient population density to take advantage of economies of scale both within and across resource areas. It is expected that the five-year Service plans for these resource areas will constitute, with some modifications, a mosaic of the individual county plans. The five-year plans will also form the basis for county and Service applications for federal or state funds to finance future projects. As mentioned earlier, the Service's enabling legislation expressly prohibits municipalities from duplicating or using facilities similar to those provided by the Service in the same area. MES also has authority to extend the boundaries of its planning regions and financing districts, or to combine two or more, to achieve more economical operation or financing after consultation with the affected municipalities. One of its first responsibilities will be to combine small and inefficient state-owned facilities in order to set an example for smaller units of government.

Administratively, the Service has substantial control over the geographic jurisdiction in which the causal and affected areas of both resources lie, as witness its authority to acquire, construct, improve, and operate waste water and solid waste projects both within and outside the State of Maryland. Although not much attention has been given this authority to undertake projects outside the state, officials of the Service indicated that they would be receptive to requests for bilateral contracts from neighboring states (including the District of Columbia) or their municipalities.[5] Theoretically such authority would allow the Environmental Service to acquire and manage all the liquid and solid waste facilities in the Potomac River Basin. However, there is little likelihood this will ever occur, because adjacent states would in effect be admitting their inability to serve their populations and abdicating responsibilities to Maryland. What is more likely is that a few small municipalities immediately adjacent to Maryland will find it more economical to contract with the MES for treatment of their wastes than to undertake the service themselves or to contract with entities within their own state.

The Service has sufficient authority in four of the five functional areas to implement waste water treatment and solid waste management programs. The only exception is the regulatory function, which it shares with the Department of Water Resources and the Department of Health and Mental Hygiene for water resources, and which it defers entirely to the latter department regarding solid wastes.[6] Neither does the Service have total responsibility for the four functional areas over which it does have authority. For instance, the Department of Natural Resources has overall planning, development, and conservation responsibilities for the state, including small watershed development, participation in interstate planning efforts with the Army Corps of Engineers, and representation on interstate enforcement conferences, such as the Washington Metropolitan Area Enforcement Conference. In addition, Maryland's newly enacted automobile bounty program, which pays $10 for old auto hulks, is administered by the State Department of Motor Vehicles.

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[5] Interview with Mr. Reed W. McDonagh, Deputy Director, Maryland Environmental Service, and Mr. Thomas C. Andrews, Natural Resources Planner, Maryland Department of Natural Resources, on August 12, 1970.

Similarly, financial authority for waste water treatment projects is shared with the State Board of Public Works, which oversees the state's financial assistance program administered by the Department of Health and Mental Hygiene which can provide grants for up to 25 percent of the total treatment facility costs for a local project. It also can prefinance the federal government's share, which can reach a maximum of 55 percent. Funds for both assistance programs are made available from state-wide bond issues such as the one passed in 1968 totaling $129 million. These programs were not shifted to the Environmental Service upon its creation because it was felt that the power to propose a project should remain separate from the power to allocate state funds. The Service must therefore apply for state funds and/or prefinancing just like a municipality, although it does have the authority to finance the full project costs, based upon a contract with the municipality concerned and the revenues derived from the operation of the facility.

Internally, the Service is organized into four functional divisions: administration, planning and evaluation, design and construction, and operation and maintenance. Within each division there is no distinction made between resource areas. Responsibility and authority clearly reside with the Service Director for the administration of these divisions, although it will be recalled he shares authority with the two other Service officers in the issuance of revenue bonds. As noted earlier, external control over the allocation of Service resources can be exercised by the Secretary of Natural Resources through his powers of removal, his right to approve Service policies and procedures, and his authority to set personnel ceilings and approve budget expenditures. Thusfar, however, the personalities and the rapport of the two incumbents have allowed MES to operate in a relatively autonomous manner.

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[6] The Department of Water Resources is the equivalent of a state water pollution control board in that it sets water quality standards, regulates surface and ground water withdrawals, monitors streams, and has control over sedimentation matters, while the Department of Health and Mental Hygiene has responsibility for assuring an adequate and potable water supply for state residents, certifies public treatment facilities are properly constructed, and licenses and inspects solid waste disposal sites.

The Service possesses considerable areal flexibility in the two resource areas over which it has authority. Organizationally, it does not appear to have much flexibility in expanding its resource areas or functions beyond those which it already has, although others may gravitate toward the Service once it proves its capabilities. However, state legislation would be required to effect this.

Financially, the Service seems quite capable of meeting its own needs. With its administration and overhead costs presently charged to the state budget, the money raised by revenue bonds and waste management contracts is available for implementing MES projects. Because the Service is free to fix and collect service charges to amortize these bonds without the approval of any state or local agency (other than the Maryland Public Service Commission should its charges be contested), the extent of its indebtedness is limited only by the need for its projects, the reasonableness of its service charges, and the conditions placed on its bonds by the underwriters.

It is important to note that the revenue bonds do not carry the full faith and credit of the state or any of its local subdivisions, but state control over Service expenditures can be exerted informally by the State Board of Public Works, which the Service voluntarily keeps advised of its actions. It might even be possible for the Service to borrow from funds administered by the Board of Public Works and to make repayment from the revenue it derives from its facilities. In effect, the Service could enjoy an amortization plan generally associated with revenue bonds while taking advantage of the lower interest rates on the state's general obligation bonds.

In addition to actually obtaining title to a facility and repaying its indebtedness through user fees, MES could build and/or operate a facility under contract to a municipality. If the Service were to build the facility under contract, it would assume initial responsibility for the local shares of the project's costs, based on the standard federal-state-local matching ratio (55:25:20), and amortize its revenue bonds from payments made by the municipality from user charges or ad valorum taxes. If the municipality retained ownership of the facility, with the Service providing the operating functions, the municipality's obligation would be financed in a similar manner, enabling it to take advantage of lower interest charges, and at the same time to make more effective use of its debt-carrying capacity. Under either approach, MES is guaranteed repayment, by the terms of its enabling legislation, from state-shared taxes (earmarked for the municipality) if the municipality should default on its obligations.

In considering alternative methods for meeting the needs throughout the state in the two resource sectors, MES relies heavily on the 10-year county master plans approved by the Department of Health and Mental Hygiene. That Department's power to approve 10-year water and sewer plans can appreciably affect potential development in rapidly growing areas, since plans for the construction of water and sewage treatment facilities must be included in the approved master plan to be eligible for state and federal funds.

As a subdivision of the Department of Natural Resources, the Service can expect to be consulted on standards for water quality, their enforcement, and similar water resources matters lying within the purview of the Department of Water Resources--another subdivision of the Department of Natural Resources. It is also likely that proposed regulations in the solid waste management area will be discussed with MES representatives prior to their adoption by the Department of Health and Mental Hygiene. Of course, the methods of treatment which the Service ultimately includes in its five-year plan must conform to the standards and guidelines of these Departments.

The Environmental Service would have to be judged as structurally compatible with existing units of government since it is an operating arm of the state, and cannot duplicate existing services as long as they are adequately administered by local government units. The Service, designed primarily as an operating agency, does not incorporate the two-tier concept of areawide management whereby the metropolitan agency holds policy-making and approval powers, while local governmental units retain direct operating responsibilities. Rather, it is expected that the Service will draw heavily on plans formulated locally and set about implementing them in the most effective and efficient manner.

Politically, even though the Environmental Service has considerable authority in the service areas for which it has responsibility, it is still limited to only two services--liquid and solid waste treatment. The control of other functional areas which bear directly on these services, such as sedimentation control, land-use planning, solid waste collection, and zoning, frequently rests with other levels of government. However, it does not appear to have been the legislative intent to broaden the Service's authority much beyond that which it was initially given. It must be remembered that MES is part of a general unit of government, the state, which is responsible for a full spectrum of public services and which does make trade-offs among governmental needs and resources, although these may not always be optimal from the viewpoint of a specific suburb.

The Service, as much as any other state agency, is accessible and accountable to Maryland residents. No specific residency or representation requirements exist for Service officers, nor are they necessary since resource policy is made entirely at the local level by locally elected representatives. The Service officers are concerned only with the details of bond issuances and the day-to-day administration of locally sanctioned policy. But because the three officers are appointed by the Secretary of Natural Resources, who in turn is appointed by the governor, the officers of the Environmental Service are twice removed from the voters who are affected by their decisions.

Decision-making authority for planning and operating treatment facilities will remain in local hands. To provide assurances on this score, a former county commissioner who was instrumental in securing passage of the MES enabling legislation was appointed deputy director of the new agency. It is expected that he will provide liaison with local communities during the agency's critical years of planning and consolidating services. As far as the Service's staff is concerned, personnel such as lawyers and engineers will work principally in Annapolis, while the actual administration of MES facilities will be carried out by local employees. As more projects and facilities are transferred to the Service, the local employees presently managing them are likely to become classified employees of the state civil service system.

To achieve active citizen participation, the Service will generally rely on the public's involvement during the planning stages at the local level. In the Washington metropolitan area access to local governments appears unfettered and there does not seem to be any reluctance on the part of its knowledgeable citizenry to utilize it. The Service requires only one public hearing in each county affected by one of its proposed five-year plans either prior to the plan's initial adoption or on the occasion of its updating every second year.

However, it is expected that the MES will work very closely with local officials in developing its five-year plan prior to its submission to the local governing body for formal approval. A hearing before the Maryland Public Service Commission is also required under MES enabling legislation should MES and a municipality be unable to reach agreement on rate structures or service charges necessary to amortize its revenue bonds. Other than authority to conduct hearings and investigations for the furtherance of its objectives, no other provisions are made in the enabling legislation to accommodate citizen involvement (e.g., citizen advisory committees) in the day-to-day decisionmaking of the Service.

The question of whether the Service holds sufficient authority and incentives to foster an active two-party interest in its affairs can be answered negatively. Its powers are confined to only two service areas, and in these its responsibilities are primarily operating. The responsibility for projecting future needs and, particularly with respect to the provision of sewage treatment facilities, the power to channel development in the county remain firmly in the hands of local governments. Existing relationships between local developers, builders, and officials will be undisturbed, and the role of the Service will be largely confined to providing technical responses to locally made decisions.

Conditions which appear conducive to producing a consensus among the officers of the service include the highly technical and generally apolitical tasks which confront them, the relative freedom which they enjoy from onerous state controls, the division of labor which exists between the day-to-day operating responsibilities lodged in the hands of the director and the financial concerns of the officers sitting as a body, and the low profile the officers will enjoy during periods of decisionmaking. Offsetting these advantages are certain disadvantages: the lack of personal security afforded members serving solely at the pleasure of the Secretary of Natural Resources, the possibility that appointments may be based on politics rather than the competency of an individual, and the lack of continuity created by the absence of overlapping terms. On balance, the factors working to promote consensus would appear to be stronger than those which would tend to divide the officers.

Finally, the influence accorded various geographic elements of the metropolitan area and the degree of protection afforded minority (numerical) interests should be mentioned. No special role is accorded these interests within the decision-making structure of the Service since its primary role is to implement policies made at the local level. Insofar as these interests are represented, they will have to be accommodated principally at the local level either through public hearings held prior to the adoption of the county's 10-year plans or during the hearings held by the governing body to consider adoption of the five-year Service plan. Recourse to state legislature is also available to aggrieved parties in the event the Service plan does not receive unanimous approval from the affected counties.

D. POTOMAC RIVER BASIN COMMISSION

1. Description

The proposed Potomac River Basin Commission (PRBC) is another organizational mechanism with potential for implementing an integrated water supply and waste management system in the Washington metropolitan area. Under the terms of its compact, the PRBC would implement the provisions of the federal-interstate compact recommended by the Potomac River Basin Advisory Committee in 1968 and, as its name indicates, it would exercise powers throughout the Potomac River drainage basin. Six months after the election of the PRBC's first chairman, all assets, liabilities, staff, and functions of the INCOPOT would be transferred to the PRBC, and the INCOPOT would be formally abolished.

The duration of the compact would be for an initial period of 100 years from its effective date, subject to renewal at 100-year intervals. The Commission would consist of six commissioners: the four state governors and the mayor/commissioner of the District of Columbia (or their designees), and an appointee of the President. If the PRBC follows the pattern of the Delaware River Basin Commission, the only operable federal-interstate commission and the model on which the Potomac and Susquehanna compacts are based, the commissioner's designees will generally be ranking state officials concerned with water resources or prominent citizens who are experts in the field.

The purpose of the Commission would be to provide for the planning, conservation, utilization, development, and management of the basin's water resources through intergovernmental cooperation at all levels among the basic jurisdictions. Service areas with which it would be specifically concerned are water supply, water quality control, flood protection, watershed management, water-related recreation, preservation of the river's environmental amenities, incidental generation and transmission of hydroelectric power, and withdrawals of water in times of emergency.

Existing government agencies concerned with water resources would be utilized by the Commission to the greatest extent consistent with the purposes of the compact; should these agencies be found unable or unwilling to take action, the Commission would reserve the right to perform the desired services. Agencies and local governments of the signatories could also contract with the Commission and with each other to implement any aspect of the Commission's program or "for the acquisition, development, and operation of park, recreation, scenic and historic areas, or for the collection and disposal of solid wastes, or to control, abate, and prevent air pollution."[7]

The Commission's principal activities would fall into three major categories: planning, programming, and review of proposed projects. Perhaps its most important activity would be the development and maintenance of a Comprehensive Water Resources Plan for the basin. This Plan would cover near-term and long-term water quality and quantity needs and would identify any public and private projects required for the optimum development, conservation, and utilization of water resources.

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[7] Potomac River Basin Compact, Article 12, Section 12.04, The Potomac River Basin Advisory Committee (Washington, D.C., October 1968).

To implement the Comprehensive Plan, a water resources program would be adopted annually by the Commission which would systematically present the projects to be implemented by the Commission, governmental agencies, and the private sector during the programming period (e.g., the Delaware Commission uses a six-year period). The Commission would be empowered to acquire, finance, contract, improve, operate, and regulate projects needed to carry out its responsibilities in any of the service areas enumerated above. It would also have the authority to regulate water diversions into or out of the basin, assign allocations to the signatory states, and temporarily control withdrawals during periods of water shortage.

Other powers would include the authority (a) to provide technical and financial assistance to existing governmental agencies to implement the Comprehensive Water Resources Plan; (b) to collect data, sponsor research and studies, and distribute technical information on existing or potential water resource problems of the basin; (c) to conduct investigations and inspections necessary to carry out its functions; and (d) to initiate actions on its own behalf to enforce compliance with provisions of the compact or any rules and regulations adopted by the Commission. These provisions or regulations would be enforced through the courts by the imposition of a maximum $500 fine for each day of violation.

One of the most controversial functions to be assigned the proposed Potomac River Basin Commission is the preparation of an Amenities Plan and related programs for the development and preservation of historic, scenic, and environmental values (e.g., parks, open spaces, recreational areas, and wetlands) along the Potomac. The compact states that the Commission shall give consideration to relevant federal, state, and local plans in developing the Amenities Plan, which will cover public and private waters, land, structures, and projects which are necessary in the Commission's judgment to develop and preserve these values. The Plan shall also provide for river zones and their accessibility; land-use plans and controls within river zones; and acquisition of existing and potential aesthetic, scenic, and historic areas within those zones.

The compact defines a river zone as a portion of the Potomac (or one of its tributaries) and an area along its shores of such length and extending inland such distance as the Commission may determine. However, the Commission may not establish a river zone without prior consultation with concerned public bodies within the affected signatory state; a public hearing; the approval of the Commissioner from the signatory state in which the river zone lies; and, if the zone is to extend inland more than one mile, the concurrence of the governing body of the locality in which the zone is located.

To implement the Amenities Plan within such river zones, the PRBC would assist local agencies in developing comprehensive land-use plans, which would ultimately be subject to Commission acceptance. Once a river zone has been created, failure of the localities to develop land-use plans and zoning regulations acceptable to the Commission would cause land uses to be frozen for those purposes to which they were actually and lawfully being put at the time the river zone was established. Under no conditions could the Commission condemn property for scenic, open spaces, or historic preservation purposes if the state or local governments act to preserve these values through zoning or other means.

The above features were retained in the version of the compact approved by the Virginia legislature (the only basin state to act favorably on the 1968 draft by February 1971, although a similar version had passed the Maryland Senate early in its 1971 session), albeit with three significant modifications. Two of the amendments modified the Amenities Plan. The first (9.06 (c)) stated that whenever any jurisdiction has enacted and is enforcing zoning or other land-use control laws, ordinances, or regulations, the powers of the Commission shall be limited strictly to the making of recommendations[8] regarding the implementation of its Amenities Plan. The second amendment (9.06 (d)) stated that prior to January 1980 the Commission shall not aid local agencies in developing comprehensive plans for river zones or have the authority to freeze existing land use in those zones. The effect of these amendments is to remove the Commission's final say on land use within river zones in political jurisdictions which have any kind of land-use control of their own, however inadequate. Jurisdictions without such ordinances are given until 1980 to adopt them.

A third amendment enacted by Virginia prohibited the extension of the powers, duties, and jurisdiction of the PRBC to underground or subterranean waters. The Potomac River Basin Advisory Committee believes this provision would be unduly restrictive and has recommended as an alternative a clause contained in the bill approved by the Maryland House of Delegates during its 1970 session which reads, "except that the Commission shall not restrict or prohibit withdrawals from any well supplying water for use in not more than five (5) households."[9]

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[8] Emphasis added.

[9] Potomac River Basin Compact, Article 3, Section 3.04 (i), the Potomac River Basin Advisory Committee (Washington, D.C., April 1970).

The PRBC capital and operating expense budget would be adopted annually with the apportionment of those costs in excess of contractual receipts and other revenues requiring the unanimous vote of the entire Commission. In the case of capital budgets, the remaining costs could be financed by bonds or other methods determined by the Commission; with respect to operating budgets, the PRBC would apportion such balances equitably among the signatories. Therefore, except for a moral obligation to meet its apportionment of the current expense budget, no signatory would be under a continuing obligation in connection with the Commission's budget without its expressed consent. The Commission would have the power to issue revenue bonds, which would be financed by fees, user charges, and (in accordance with applicable state laws) special assessments upon properties of governmental agencies and persons specially benefiting from its water management and flow regulation projects. It would also be exempt from taxation by governmental agencies (except transfer, inheritance, and estate taxes), but would make payments in lieu of taxes to local taxing authorities.

A key element in gaining approval for the compact has been the degree of autonomy retained by the signatory and local governments. Commission decisions would hinge on the vote of the affected state's commissioner on such matters as:

- The discharge of functions outside the basin but within the signatory state.
- The operation or construction of facilities solely for recreational purposes.
- The establishment or extension of river zones.
- The enlargement or reduction of "protected areas" designated as potential water shortage areas.
- The authorization to enter into agreements with federal, state, and local agencies.
- The adoption of the annual operating budget and those portions of the capital budget not covered by a specific contract with the affected parties.

Other safeguards of local and state prerogatives regarding the creation and extension of river zones and the application of zoning and land-use controls within them were mentioned above.

Considering the question of the federal government's sovereignty when it is a party to a federal-interstate compact, the diverse interests within the basin, and the problem of maintenance of local autonomy while at the same time preserving and developing the water resources of the basin, a lead time of five years would not seem unrealistic for the PRBC to attain operational status. The question of whether a basin-wide territorial jurisdiction encompassing such diverse interests is necessary for the implementation of an integrated waste management program in the Washington metropolitan area will be analyzed below.

2. Analysis

The proposed PRBC would have adequate territorial jurisdiction over the three resource areas with which this paper is concerned. Its territorial jurisdiction, like that of the INCOPOT, would be confined to the Potomac River Basin, although it could exercise its powers outside the basin with the consent of the commissioner from the affected state. The air pollution abatement and solid waste management responsibilities delegated to the Commission would be based on the same jurisdictional constraints. Once INCOPOT's functions and staff were absorbed by the Potomac River Basin Commission, the Commission would be in the unique position of being the only agency charged with responsibility for overseeing the entire basin. Although it may be argued with some justification that this degree of territorial authority is not required to administer air and solid waste programs, it would appear quite reasonable for the PRBC to divide the basin into sub-districts, similar to those of the Environmental Service, to administer those programs on a more localized basis.

It seems likely the Potomac River Basin Commission could achieve certain economies of scale in the water resources area, such as the regionalization of waste water treatment facilities, soon after its formation. An extension of its authority to other resource areas would be dependent upon the requests of signatory governments. These governments would probably not seek contractual arrangements with the Commission until the PRBC proved its capabilities in the service areas for which it would have primary responsibility. Once PRBC's capabilities had been proven, there would be no reason why economies of scale both within and across resource areas could not be achieved.

With Maryland, Pennsylvania, Virginia, West Virginia, the District of Columbia, and the federal government as signatories to the compact, the PRBC unquestionably would include the geographic jurisdiction necessary for achieving effective political control over the causal and affected areas within the basin for each of the three resource areas. The proposed compact specifically states that the Commission will have power in all five of the functional areas mentioned previously. However, it limits the exercise of all but the planning function to those cases in which existing government offices or agencies which have functional authority fail, or are unable, to take action consistent with the Commission's objectives.

From a policy-making standpoint, the Commission would not have a unified command. Since each commissioner would have one vote, no individual commissioner would be held solely accountable for the Commission's decisions. The question of unity of command, structural authority, and the span of control of the executive director are dependent upon the final shape of the administrative organization, which will not be known until the Commission is formed. With the commissioners, each representing one of the signatories, holding final budget approval authority, the internal allocation of resources would not be an autonomous decision on the part of the agency. Potential adverse effects upon agencies of the signatory governments and their programs would inevitably weigh heavily on the Commission's decisions.

Functional flexibility could be considerable, depending upon the way in which the Commission chooses to interpret its powers immediately following its establishment. They could be narrowly interpreted to include only those functions which are clearly stated in the compact, as the Delaware River Basin Commission has done, or they could be given a liberal interpretation in order to test the Commission's strength. The areal flexibility which the Commission would hold is also significant. By the terms of the compact it is authorized to exercise its powers outside the basin with the consent of the commissioner from the affected state and to extend river zones inland beyond one mile with the approval of the affected local governing body and the state commissioner.

Temporal flexibility is somewhat constrained by the compact's initial 100-year life span (many compacts are enacted in perpetuity). However, the Commissioners may at any time recommend compact amendments to their respective legislatures and are "required" to report to them at least once every 10 years on the desirability of amending the compact. In addition, a signatory government may announce its intent to withdraw from the compact from 7-12 years prior to the termination of any 100-year period.

Financial resources appear to be adequate, with the PRBC empowered to apportion certain operating and capital budget costs by a unanimous vote of the commissioners, to perform certain services or construct specific projects under contract with one or more signatories, to issue revenue bonds financed by user charges, and to levy special assessments on properties specially benefiting from its water management and flow regulation projects (in accordance with applicable state laws). In addition, although the Commission may not engage in the construction and operation of hydroelectric generating and transmission facilities as a primary undertaking, it may provide means for the transmission of hydroelectric power and energy produced by a Commission facility, where such means are not otherwise available upon reasonable terms, for the purpose of wholesale marketing of power.

With respect to the Commission's annual operating budget, which would include funds for such functions as planning, administration, and project review, the compact states that the signatories "agree to include the amounts allocated and apportioned for the support of the current expense budget of the Commission in their respective budgets next to be adopted, subject to such review as may be required by the respective budgetary procedures."[10] It may be noted that this does not obligate the signatories to pay the apportioned amount but only to include their allocations in the forthcoming budget requests submitted to their respective legislatures. The budget would, therefore, be dependent on the appropriation processes of the signatories, and this would leave the Commission without recourse in the event one of the parties failed to meet its obligation. Historically, however, parties to interstate and federal-interstate compacts have met their obligations.

The issuance of revenue bonds might soften financial peaks and troughs resulting from dependence upon such voluntary contributions. Funds raised in this manner could be used for project construction, interest charges, any incidental expenses (e.g., legal, engineering, financial) connected with the bond issuance; the creation of an operating, construction, reserve, or sinking fund; and for all other expenses connected with the planning, design, acquisition, construction, or reconstruction of any facility. The latter provision might be interpreted to permit the study of a project's relationship to other facilities in the region, as well as review of its conformity with the Comprehensive Plan.

The PRBC's authority to consider alternative goals and approaches in service areas over which it does not have direct operating responsibility (e.g., transportation and housing) would be supported by its power (a) to reject projects which are in substantial conflict with the Comprehensive Plan, (b) to control changes in land uses within a river zone until acceptable land-use planning and zoning provisions have been adopted, (c) to approve federal, state, and local governmental projects before expenditure or commitment for their construction, acquisition, or operation can be made, and (d) to capitalize on public opinion that more attention should be given to environmental considerations in future developmental decisions within the basin. However, the degree to which the signatories desire the Commission to exercise the full range of its responsibilities will determine whether sufficient funds become available to allow the PRBC staff to analyze trade-offs among various courses of action.

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10. Potomac River Basin Compact, Article 14, Section 14.01, Paragraph (C), The Potomac River Basin Advisory Committee (Washington, D.C., October 1968).

The unusual nature of the proposed PRBC in the context of traditional federal-state-local relationships perhaps constitutes its greatest weakness. Being a federal-interstate agency, it would be an agency of the federal government, of each of the states, and of the District of Columbia. It would exercise certain delegated governmental powers but would have no specific constituency of its own. The PRBC would be dependent upon existing units of government for the selection of members to its governing body and for much of its financial support. It would also be required to work through existing offices and agencies to the extent that their activities were consistent with the purposes of the compact. However, the Commission could chose to bypass them if they failed to act in accordance with the purposes of the compact.

Planning and regulatory functions of state, regional, and local governments might also be adversely affected if they were found by the Commission to be in substantial conflict with the Commission's plans and regulations for water resources and other public values. The degree to which the PRBC could regulate the facilities of the federal government as a party to such a compact was discussed above, but some uncertainty will always surround this issue. This situation would seem to place the federal-interstate compact in a "no-man's land" in which its ambiguous institutional character might inhibit its exercising the full range of power which it would possess.

On the positive side, the PRBC would facilitate a two-tier division of labor between the policy-making/approval and management levels, insofar as it was consistent with Commission policy. Theoretically, it would possess the flexibility to delegate as many of its services or functions as seemed appropriate. For example, the Commission could approve the operation of a waste water treatment facility by a state or local agency or it could operate the facility itself. It could acquire, construct, and operate the facilities for some services (e.g., water quality monitoring stations) while permitting the development of facilities for others (e.g., reservoirs for water supply) to proceed under the aegis of existing agencies.

As far as political criteria are concerned, the scope and depth of the Commission's services and functions would be quite substantial. Although its primary focus would be on water resources management, the Amenities Plan would give it considerable power over land-use planning and zoning decisions affecting water resources, and Section 12.04 (authorizing the PRBC to acquire, develop, and operate park, recreational, scenic and historical areas, and facilities for the collection and disposal of solid wastes, and to control, abate, or prevent air pollution) provides for a more liberal delegation of authority than found in any of the institutions analyzed. All of the services included in

Section 12.04, except the control of air pollution, lend themselves to service charges which could be used to amortize revenue bonds.

Direct PRBC accountability to those in the District of Columbia metropolitan area affected by its decisions will be lacking. The visibility, accessibility, and influence of the PRBC's decisionmakers are likely to be limited, because the appointed commissioners would not be required to be residents of the metropolitan or even the basin area which they represent and would hold their appointments (in most instances) in addition to regular departmental positions. Since the metropolitan area would have only one vote (i.e., the D.C. representative) which could be said to be directly and solely accountable to it, the area containing the bulk of the basin's population could be outvoted on every issue except those for which the approval of the specific state commissioner is required. And even then, a majority of those persons residing within the close-in Maryland and Virginia suburbs could not be sure their wishes would be represented by their commissioners. As is the case in most situations where special assessments are permitted, property owners who may not even have wanted a particular Commission project, but who do specially benefit from it, can have a special assessment for water management and flow regulation projects imposed upon them by the Commission against their will (see Section 14.04 of the proposed compact).

Provisions in the compact for achieving active citizen participation include authorization to establish advisory committees (e.g., composed of representatives from various levels of government, water resources groups, labor, and agriculture) which may be basin-wide, regional, or local, as the Commission may decide; and the requirement for public hearings prior to the adoption of water resources programs, annual capital and current expense budgets, and the Comprehensive Plan and subsequent amendments. Additional hearings could be initiated by petition when legitimate public interest was demonstrated. All official plans, programs, budgets, reports, and the public hearings would be accessible to the public. However, it is significant that the authority to create the advisory committees is permissive, not mandatory, and that the public hearings mentioned seemingly constitute, as most public hearings do, the last step in the decision-making process--usually a mere ratification of decisions previously reached. The compact lacks specific requirements that citizens of the basin, let alone those of the metropolitan area, participate in a meaningful way early in the decision-making process.

The above shortcoming could be offset in part by the inclusion of specific requirements for advisory units in the enabling legislation enacted by the respective signatories. For instance, the bill approving the Potomac River Basin Compact passed by the Maryland Senate in the 1971 session requires that the Maryland Potomac Water Authority (with an expanded membership) serve as an advisory committee to the Maryland member of the PRBC.[11] Among the committee's responsibilities would be to advise the Maryland commissioner regarding the effects of PRBC activities on local governments and institutions in the Maryland portion of the basin and to apprise him of their needs. In fact, the appointment of the commissioner to serve in place of the governor is to be made from a list of three nominees submitted to the governor by the authority.

Regarding its ability to foster active two-party interest in its affairs, one would think the breadth of the PRBC's responsibilities and its legal and administrative authority would attract many applicants for the alternate's position. But because the position will generally be filled by an incumbent officeholder, whose attentions will be divided, and because there will be relatively little prestige, public exposure (except perhaps in a punitive role), or financial incentive involved, the positions are not likely to command more than a grudging acceptance by the appointee as an additional responsibility. If the positions were elective rather than appointive, and if they were financially attractive, they might generate more interest--but increase costs for the signatories. If the situation remains as outlined in the proposed compact, the designation of alternates would be simply another minor appointment required of the governors and the President.

As far as facilitating consensus on objectives among Commission members, most of the factors contributing to its achievement are present in the compact. The size of the Commission (six) and the fact that the alternates may have similar backgrounds and be heading similar departments are conducive to the development of friendships and understanding, even though each member represents only a portion of the basin rather than the entire watershed. The alternate's tenure of office, serving as he does at the pleasure of the governor or President, partly lends itself to long-range planning, but this same factor provides him with more authority than he would have as an independently chosen commissioner. Continuity is provided more by accident than by design simply because the terms of the respective appointing chief executives do not all coincide. Although it is doubtful that it would be found desirable to divide the Commission into committees, the fact that the Commission can hold private meetings or hearings should facilitate its reaching agreement on controversial subjects.

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[11] The Maryland Potomac Water Authority presently consists of 10 members who include (1) one representative each from the governing bodies of Allegany, Frederick, Garrett, Montgomery, Prince Georges, and Washington counties; (2) a chairman who is appointed by the governor and serves at his pleasure; and (3) the heads of the Department of Water Resources and the State Department of Planning, and the general manager of the Washington Suburban Sanitary District as ex officio, non-voting members. The compact enabling legislation would add representatives from Carroll, Charles, and St. Mary's counties increasing the voting membership to 10.

Finally, the role accorded the central city of the metropolitan area is quite considerable under the compact. The District of Columbia representative constitutes one of the six votes on the governing body. Provisions for the protection of minority viewpoints have already been mentioned in the sections describing specific subjects upon which the consent of the commissioner from the affected state is required before action can be taken, and in the discussion of those matters on which public hearings are required. Suffice it to say that the ability of a minority to gain its objective depends, in the case of the commissioner's consent, upon its influence at the state level and, in the case of public hearings, on its ability to exert substantial pressure late in the decision-making process. Barring the inclusion of provisions requiring an extraordinary majority on certain kinds of issues, neither of the existing provisions appears to guarantee adequate representation for minority views.

E. METROPOLITAN WASHINGTON WASTE MANAGEMENT AGENCY

1. Description

A fifth organizational mechanism which possibly could provide environmental management services for the metropolitan area is the MWCOG-sponsored Metropolitan Washington Waste Management Agency (MWWMA). The Agency has existed, at least on paper, since 1967, but it has yet to begin operations due to its dependence upon voluntary agreements. Its objectives, according to its articles of incorporation, are to identify mutual areawide problems concerning the treatment, utilization, and disposal of liquid and solid wastes; to develop, in consultation with local governments, a metropolitan waste management plan and program; to develop cooperative arrangements among local governments for the implementation of a metropolitan waste management plan and program; and to acquire, develop, and manage facilities for the implementation of a metropolitan waste management program.

The boundaries of the Waste Management Agency coincide with those of MWCOG, and its board of directors are members of the MWCOG board and its Environmental Health Policy Committee. The Agency's board, which has between 12 and 18 members, has the authority to appoint an executive committee (consisting of at least three directors) to manage day-to-day operations.

The decisions of the MWWMA will in no way be binding upon the governments represented on its board.

The Agency is empowered to issue revenue bonds financed by fees and user charges from jurisdictions benefiting from its services or facilities, but it does not have authority to issue shares of stock based on its corporate status. Approval has been obtained from the Internal Revenue Service for tax-exempt status; although it will not have to pay federal, state, or local taxes, the Agency will probably make payments in lieu of taxes to local jurisdictions in which its facilities are located.

The Waste Management Agency's board of directors has held initial discussions with representatives of some of the 15 metropolitan jurisdictions to determine the basis upon which user charges to finance its revenue bonds might be apportioned among the participating governments. Several jurisdictions have expressed interest in participating in the Agency, and it does not appear that failure to attract the support of all 15 MWCOG jurisdictions will deter the activation of the MWWMA. It is anticipated that the Waste Management Agency will become operational sometime during fiscal year 1972.

2. Analysis

The Waste Management Agency has been perhaps the least publicized attempt to come to grips with waste management problems in the metropolitan area, despite the fact that it may be engaging in direct operations before any of the other agencies previously discussed. As one would expect, many of its organizational features are similar to those of MWCOG. In essence, the Agency constitutes the operating arm of MWCOG in the liquid and solid waste field.

Like MWCOG, the Agency encompasses sufficient territory to include the natural planning areas necessary for the implementation of a solid waste management program in the metropolitan region. The same does not hold true for liquid wastes, for both agencies lack the geographic jurisdiction to encompass all aspects of water quality management, such as water storage for low-flow augmentation, which can perhaps be more efficiently implemented upstream and outside the metropolitan area. However, within its limited scope of services, the Waste Management Agency has substantial authority to plan, develop, and operate waste treatment facilities, and it seems capable of realizing economies of scale in operations both within and across liquid and solid waste lines.

Because the Agency's decisions are not binding on the governments participating in the corporation, it therefore cannot politically control the local governments with jurisdiction over the causal and affected areas of liquid and solid wastes generated in the metropolitan area, other than by the terms of specific service contracts with the local jurisdictions. On paper, at least, the Agency has authority over four of the five functions (i.e., planning, financing, construction, and operation), but this power is more apparent than real. The Agency does have the power to plan and program facilities although some of this is already being done on a macro level by MWCOG. The construction and operation functions are to be carried out on behalf of the participating governments and financed by revenue bonds supported from service charges levied by (or for) the participating governments. Under no circumstances could the Agency undertake these functions without the authorization of the affected local jurisdiction.

The issue has not yet been resolved as to whether the Agency (a) will merely utilize the existing MWCOG staff and contract the actual operations to private firms, (b) develop its own operational capabilities in the two service areas, or (c) merely act as a coordinator/developer returning the facilities to the participating governments for operation after they have been developed as part of an integrated metropolitan program. If the first alternate is chosen, the organization will inherit the organizational strengths and weaknesses of MWCOG. It would also appear that the Agency will have little latitude in internally allocating its resources because they will be based upon service contracts for specific purposes. However, the Waste Management Agency would possess both functional and temporal flexibility in that its functions and powers could be expanded and, although it has perpetual succession, the Agency could be dissolved by mutual consent at any time after discharging its outstanding obligations and liabilities and distributing its remaining assets among the participating governments.

Strictly speaking, the Agency has the financial capability to administer the services for which it has been given responsibility. But, as was mentioned above, because of its dependence on contract payments from participating jurisdictions to amortize its bonds, no claim can be made that the Agency exercises independent control over its financial affairs.

The Agency can consider various alternative goals and approaches for accomplishing its objectives because of the dual role which the MWCOG staff plays. However, final review authority for liquid and solid waste projects still resides with MWCOG. To the extent the Agency is able to administer only two services, it is considered a special district (as contrasted with a general unit of government such as a county) incompatible with existing governmenmental units, and thereby contributing to the fragmentation of local governmental responsibilities. Some duplication of functions will inevitably result, particularly in planning efforts to integrate numerous independent projects. But in most instances the local jurisdictions will be contracting with the Agency to perform some function which they are unable to undertake themselves or for which it is more economical to contract with the Agency.

Although the spectrum of the Agency's services is limited, a two-tier concept of metropolitan government could be said to apply if the MWWMA confines itself to planning, to the issuance of revenue bonds, and to the construction and operation of regional waste treatment facilities, and leaves the responsibility for collection to the local municipalities. This feature, combined with the susceptibility of its services to user charge financing and its interstate nature, makes the Agency the more likely forerunner of a future metropolitan government than any of the organizations discussed thusfar.

The MWWMA suffers from the same shortcomings as MWCOG insofar as political accountability is concerned. Its responsibility to metropolitan residents is indirect at best because of its constituent unit form of representation. It is the local government, through property taxes and/or user charges, that bears the burden of accountability to the public for services which it provides. Furthermore, although many of the members of MWCOG's board may be known outside their own jurisdictions, it can hardly be expected that the other members of the Agency's board will be known throughout the metropolitan area.

It is unlikely that additional mechanisms, beyond those already afforded through MWCOG, will be established by the Agency to consider citizens' views in its decisions. In fact, the Agency's services will be undertaken entirely through executive agreements or contracts with existing local governments, and any public hearings on those agreements will probably be undertaken by the local governments rather than by the Agency. The Waste Management Agency should receive spillover benefits from two-party competition for MWCOG's board seats and, should continued public concern over the environment greatly enlarge this aspect of MWCOG's activities, a situation may develop in which the Agency will become the only viable instrument for effecting pollution abatement and membership to MWCOG's board will be sought for this reason. However, the urgency of this problem and the public's financial commitment to meet it would have to change appreciably before this situation would prevail. Until then it is unlikely that a local officeholder will seek a seat on MWCOG's board solely for the purpose of governing the Agency.

Many of the factors that facilitate consensus among members of the MWCOG board are not shared by the Agency. Some would appear to be dysfunctional, such as the additional burden which the Agency places on the parttime MWCOG board members and the increased size of the membership as the result of the inclusion of the Environmental Health Policy Committee. On the other hand, this homogeneous group may contribute increased understanding of the problems, which will more easily produce a consensus. Finally, failure to give special recognition in future bylaws to the District of Columbia as having a paramount role in the delivery of waste management services would reduce the likelihood of the Agency's success.

F. COMPARATIVE ORGANIZATIONAL STRENGTHS AND WEAKNESSES

Some perspective on the comparative strengths and weaknesses of the five organizations analyzed above can be gained from the accompanying matrices (Figures 5 and 6). Figure 5 shows the depth of responsibility each organization has in the four service areas. Figure 6 shows which of the 12 institutional criteria each agency satisfies in the service areas for which it has responsibilities.

The markings in each cell of Figure 5 are relatively straightforward and are derived entirely from the enabling legislation or interstate compact authorizing the formation of the respective agencies. The markings in Figure 6 are more subjective in that the decision to mark a particular cell may reflect the degree in meeting certain criteria than simply presence or absence of a given characteristic. Closely akin to this issue is the fact that the spectrum between total realization and total failure to meet each criterion may differ vastly, both in complexity and length, and the relative weights which might be accorded each would differ, based on the perspective of the evaluator and the point in time he was making the evaluation. Therefore, no attempt has been made to assign qualitative or quantitative weights to the criteria, with the result that the final product of this analysis represents a ranking of the institutions accorded to their propensity to administer an integrated water supply and waste management program in the immediate future.

In assessing the strengths and weaknesses of the five agencies, it is first important to note the services and functions with which each is concerned (Figure 5). Only two--the PRBC and MWCOG--have authority in all four service areas. Two of the remaining agencies--the Maryland Environmental Service and the Metropolitan Washington Waste Management Agency--have responsibility for both sewage and solid waste services but not for water supply or air. INCOPOT, the remaining agency, has in the past been limited to water pollution concerns, although recent amendments have broadened its powers to include other water-related concerns. Of the four service areas, sewage and solid waste responsibility are held by four agencies, and water supply by two, and air pollution by only two.

As far as functions are concerned, all agencies but INCOPOT have authority to plan for sewage and solid waste management services, with MES, PRBC, and MWWMA empowered to construct and

Institutional Authority	SERVICES AND FUNCTIONS																			
	Air					Water Supply					Sewage					Solid Waste				
	Planning	Finance	Construction	Operation	Regulatory	Planning	Finance	Construction	Operation	Regulatory	Planning	Finance	Construction	Operation	Regulatory	Planning	Finance	Construction	Operation	Regulatory
INCOPOT																				
MWCOG	X					X					X					X				
MES											X	X	X	X		X	X	X	X	
PRBC		X	X	X		X	X	X	X	X	X	X	X	X		X	X	X	X	
MWWMA											X		X	X		X		X	X	

FIGURE 5. Services and Functions of Alternative Institutional Arrangements

Appendix B

DETAILED EXPLANATION OF INSTITUTIONAL CRITERIA FOR ADMINISTERING A METROPOLITAN-WIDE WATER SUPPLY AND WASTE MANAGEMENT PROGRAM

Appendix B

DETAILED EXPLANATION OF INSTITUTIONAL CRITERIA FOR ADMINISTERING A METROPOLITAN-WIDE WATER SUPPLY AND WASTE MANAGEMENT PROGRAM

The criteria suggested in the studies discussed in Appendix A are mainly related to water resources management. However, with some modification they can be applied to an integrated water supply and waste management agency, as well. Figure 3 on page 6 listed twelve criteria, synthesized from those in Appendix A, which are applicable to such an agency. The twelve criteria have been divided into three categories: economic, administrative, and political. Application of the economic and administrative criteria in allocating functions and subfunctions between various units of government will invariably be modified by voter accountability, citizen access, structural simplicity, and related political considerations. In the discussion of political criteria below, however, only the implications these considerations have for the institutional design of the agency will be analyzed. Analysis of the political feasibility of the institutional model outlined in Section III is beyond the scope of this paper.

The twelve criteria are neither rigorous nor completely compatible with one another in all circumstances. Their use for evaluative purposes shares the same methodological shortcomings of most social science efforts in that they can only suggest tendencies under various sets of circumstances. For instance, the desire to realize certain economies of scale would logically lead to larger and fewer governments, whereas concern for maximizing citizen participation would tend to favor smaller, more numerous, governments.

To reach an agreement as to what kind of institutional arrangement can "best" provide a particular service, or set of services, each of the factors would have to be weighted, since all cannot be of equal value. Different individuals, however, will have different ideas as to what these respective weights should be. Various interests will line up behind and against certain criteria, and their power will, of course, vary at different times within the same jurisdiction, as well as between jurisdictions. It follows that each criteria cannot be maximized, or even optimized. But perhaps by focusing attention on the critical institutional factors, the criteria will at least be accorded some recognition in the decision-making process allocating services and functions.

A. ECONOMIC CRITERIA

1. Ability to Internalize Externalities

The requirement that the administering agency encompass sufficient geographic area to internalize the externalities associated with the services for which it has responsibility would logically mean different boundaries for each resource, i.e., a drainage basin or airshed. However, the Washington Metropolitan Area, encompassing almost 3 million people and approximately 2500 square miles, includes only a portion of these hydrologic and meteorological regions. The service areas for the metropolitan solid waste management services, on the other hand, lie well within the boundaries of the metropolitan area since they are dependent to a considerable extent on population density and commercial and industrial concentrations located near the center of the metropolitan area.

The fact that the natural planning regions for water resources management and air pollution control extend well beyond existing metropolitan boundaries means that, if these services are going to be provided on a metropolitan basis, several alternative institutional arrangements are available.

- Each service could be administered by a metropolitan-wide district.
- Each service could be carried out by a subregional arm of an interstate river basin or air pollution control agency.
- Each service could be implemented separately through agencies of the two states and the District of Columbia.
- Both services could be performed by a unit of government responsible for several functions but which had the capability to take into account the extra-metropolitan effects on its respective resources.

Without going into details at this point regarding the proliferation and public accountability of special districts, the problems inherent in establishing and maintaining a viable interstate agency, and the representative inadequacies of a state-administered metropolitan program, suffice it to say that the organizational decision has already been made for air pollution control by the designation of the boundaries for the National Capital Air Quality Region as coterminus with those of the Metropolitan Washington Council of Governments (MWCOG).

Unless the boundaries for administering the water resources management program are to lie considerably beyond those required for the other resources (with all the problems of functional coordination that implies), serious consideration will have to be given to reducing the program's geographic scope to coincide with that of the other programs. As the Kneese and Bower study pointed out, control can still be maintained over external waste dischargers by setting and enforcing water quality standards at the points of confluence with the metropolitan area. The use of market-like devices to reconcile external costs and benefits imposed by, or upon, extra-metropolitan agencies could also be employed. Such an arrangement would not obviate the need for an overall river basin agency to administer all the aspects of a water resources management program outside the metropolitan area. In fact, the proposed federal-interstate Potomac River Basin Compact discussed in Section II would seem to be ideally suited to administer such a program. The Compact agency could operate in a manner similar to that of the French river basin agencies, overseeing the construction of water retention facilities upstream, guaranteeing a certain minimum water availability, and releasing water for consumptive and low-flow augmentation purposes on a reimbursable basis.

2. Ability to Achieve Economies of Scale

The second criterion is concerned with lowering the per-unit costs of providing a given service. Given a population density of sufficient size, it generally follows that the larger the size of the benefit area for a given service, the lower the unit costs will be. Inherent in a larger geographical area, for example, are--

- A broader tax base.
- Increased efficiency from centralized overhead functions such as planning, budgeting, hiring, and purchasing.
- The financial and programmatic capability to attract and retain competent managerial and technical personnel.
- The ability to support centralized research and testing facilities.
- The capability to employ the most advanced technological equipment and procedures.

Additional economies of scale can accrue across service lines when the management of several services is integrated over a large area. Suppose, for example, that the population density and geographic scope of a solid waste management program were large enough to support several incinerators throughout the metropolitan area. Significant cost reductions could be realized by locating some of the incinerators adjacent to waste water treatment facilities. Not only could the effluent from the treatment plant be utilized to cool the incinerator, but the sludge resulting from treatment of the waste water could be incinerated at the site--thereby saving the costs of land necessary for sludge drying and greatly reducing transportation costs. These cost savings are not to be taken lightly, since, according to one source, the handling and disposing of sludges often account for 25 to 50 percent of the total capital and operating costs of sewage treatment.[1]

Metropolitan coordination within, as well as between, services would reduce operating costs by locating facilities to minimize the amount of transportation needed to accomplish a particular service. For instance, if the District of Columbia government had been able to secure suitable landfill sites in the near-in sections of the metropolitan area, it would not have been forced to seek a site in Prince William County, Virginia, to which its refuse could be transported by barge via the Potomac River.

Recognition of the interrelatedness of urban services and the advantages which can accrue if they ultimately can be operated, or at least coordinated, on a large-scale basis has been behind recent discussions by metropolitan officials to include Fauquier and Charles Counties (lying in Virginia and Maryland, respectively) within the jurisdiction of the Washington Metropolitan Council of Governments.

B. ADMINISTRATIVE CRITERIA

1. Control of Causal and Affected Areas

The first administrative criterion concerns the service agency's ability to command sufficient geographical jurisdiction to effect political control over the total causal and affected areas necessary for the effective performance of its service. This requirement differs materially from the economic criterion of internalizing externalities associated with that service in that the focus is on including the governmental unit which produces, or is affected by, those externalities. Particularly with reference to those units located on the periphery of the metropolitan area, this may mean the inclusion of more territory than mere economic considerations of a particular resource would indicate.

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[1] American Chemical Society, Cleaning Our Environment: The Chemical Basis for Action (Washington, D.C., 1969), p. 106.

Such a jurisdictional overextension is not as critical as it might appear. First, one is never quite sure what direct and indirect effects decisions made in the urbanized areas have on adjoining semirural and rural areas. Moreover, the latter areas make decisions which affect the urbanized section of the particular governmental unit, and poor decisions made by them will ultimately divert energy and resources from the urbanized portions of that unit and also indirectly affect the rest of the metropolitan area. One only has to look at the lack of land-use planning and zoning regulations or the use of septic tanks and package waste water treatment plants which have been prevalent in many previously rural areas to appreciate the significance of this observation. With the present pattern and rapidity of metropolitan growth in Fairfax, Prince Georges, and Prince William Counties, for example, it becomes impossible to determine precisely where the predominant influence of the urbanized portions stop and the rural influence begins. Under these conditions it is better to include too much rather than too little territory.

2. Adaptable Legal and Administrative Authority

A second administrative criterion necessary for the effective governmental performance of a given service is the possession of sufficient legal and administrative authority to implement its decisions and the ability to adapt this authority to changing circumstances. From a legal standpoint, this means that if an agency is given responsibility for performing all or some of the five functions usually associated with the urban service delivery--i.e., planning, financing, constructing, operating, and regulating--it should also have legal powers commensurate with these responsibilities. Such powers would include the following:

- Authority to develop a comprehensive plan for providing the service.

- Review and approval power of plans submitted by subordinate units, based on their conformance with this plan.

- Authority to issue revenue or general obligation bonds, or both.

- Power to set charges or fees and to levy taxes to finance indebtedness.

- Right of eminent domain.

- Authority to construct and operate facilities either in the first instance or as a residual right should local governments fail to meet their responsibilities.

- Right to hire consultants or subcontract to other governmental or nongovernmental entities.

- Power to sue and be sued.

- Right of existence equal to, or preferably in excess of, the time period required to amortize outstanding indebtedness, which may extend for as long as 50 years.

- Authority to set standards, investigate alleged noncompliance, hold hearings, and seek judicial redress.

Administratively, of course, it is not necessary that all five functions be performed by the same agency. In fact, disagreement exists as to whether all five should be located within the same governmental agency. The regulatory function is cause for particular concern in this regard. Should the same agency be responsible for setting standards and for the planning, financing, construction, and operation of projects necessary to implement them? To avoid charges of being self-serving and to permit maximum flexibility in implementing pollution abatement programs, alternative and sometimes contradictory approaches (e.g., construction grants versus enforcement conferences) might best be lodged in separate agencies. However, if the decision is made to locate them within the same agency, as in the case of the New York City Environmental Protection Administration created in 1968, a maximum degree of internal separation should be maintained.

The desirable features of an administrative structure are those familiar to most public administrators. There should be a unity of command with ultimate responsibility for coordinating all services and functions lodged in one individual. The channels of authority should follow a hierarchical pattern, making everyone in the pyramid administratively answerable to the chief administrative officer. Moreover, the number of section heads reporting directly to the chief administrative officer should be small enough so that he can give each adequate attention. Finally, the right to allocate resources and the ability to shift personnel within and between service and functional areas should lie within the prerogatives of the chief executive.

Service, functional, temporal, and areal flexibility are important for several reasons. First, the areawide agency may outlive its usefulness in administering a particular service. Under such circumstances it should be permitted to divest itself of this responsibility and to spinoff the service to another governmental agency or corporation. Secondly, it should have the authority, either upon request or by assumption, to accept new services or functions if it is found that subordinate units of government are not adequately meeting their responsibilities. Third, since in all likelihood it will have to expand its territorial jurisdiction to keep pace with the urbanization of rural areas in the metropolitan area, the agency should have the power to do so if the expansion is desired by the affected jurisdiction. Lastly, reasonable latitude should be given the areawide agency in determining the degree of decentralization required in administering various urban services and the five functions. The characteristics of the particular service and the capabilities of the governmental units involved will influence decisions in this regard.

3. Adequate Financial Resources

Complementing the provision of adequate legal and administrative authority is the third administrative criterion--sufficient financial resources to enable the areawide agency to exercise its responsibilities. Mention has already been made of the requirement of legal authority to issue general obligation and revenue bonds and the ability to amortize them through ad valorum taxation and user charges, respectively. Pressures will inevitably arise to retain some of the authority to issue general obligation bonds in the hands of the voters, thereby impairing the fiscal independence of the agency. To require voter approval for individual projects would seem to be excessively cumbersome. A more desirable approach, and one which would allow the agency to take maximum advantage of subtleties in the bond market, would be to permit the agency to issue bonds based entirely on the decision of its governing board and limited only by (a) the sources and amount of available revenue; (b) the value of the agency's mortgageable assets; (c) federal and/or state limits on the amount of indebtedness permitted, based on a fixed percentage of taxable property equalized to full market value; and (d) approval of rates, fees, and other charges by the state public utility commission responsible for reviewing those matters in the affected areas.

Of course, this argument presupposes a governing board composed primarily of elected representatives. To the extent this assumption is diluted by the appointment of board members on the basis of constituent governments, en toto or in part, its validity is correspondingly reduced. Secondary representation, i.e., a board composed of constituent government representatives, as opposed to indirect voter representation (which occurs in all popularly elected bodies), would not appear sufficient to authorize indebtedness without direct voter approval.

Other sources of revenue, besides user and service charges, for which an areawide agency could be given authority are sales and income taxes. Equitable administration of property taxes could be facilitated if the agency was also authorized to establish subordinate subdistricts for taxing purposes. With such power, the governing board of the areawide body could limit part of its tax levy, or apply an added levy, to those areas in which the residents receive special benefits and services.

A variation of the approach used by Redwood City, California, might be adopted by a metropolitan-wide interstate agency. The Redwood City General Improvement District was established as an arm of the city government, with the city council serving as its governing board. The District can levy property taxes and issue bonds separate from those of the city to finance projects benefiting specific properties within its borders. One of the primary reasons for creating the District was to provide the necessary facilities for a newly developing area without burdening the taxpayers of the established community with the costs of major capital projects benefiting a specific area.

Administrative simplicity could be achieved in collecting property taxes, as well as sales and income taxes, if the metropolitan-wide agency was also empowered to "piggyback" similar federal, state, and local taxes up to a stated percent. This would alleviate the need for the creation of a separate bureaucracy to administer the taxes and would require only a small staff for receiving, dispersal, and accounting. It would also seem prudent to restrict the use of general obligation bonds to the financing of capital projects and to utilize revenue bonds, backed by user and service charges, to finance both capital and operating costs. However, under no circumstances should the metropolitan-wide agency be dependent for its revenue or budget upon the voluntary contributions of participating jurisdictions for revenues to amortize its bonds or for its budget.

4. Ability to Consider Alternatives

The metropolitan-wide agency should be authorized to consider alternative goals and programs among the various services, including those for which it does not have direct operating responsibility. This authority can have at least four elements: (a) review of plans and projects for subregional agencies over which it exercises control and which have direct operating responsibilities for a particular service or set of services; (b) authority to appoint from its membership or from the general community a member to serve without vote on independent agencies, e.g., the Washington Metropolitan Area Transit Authority, to assure its views are at least considered in their decisionmaking; (c) power to review and comment on all plans and projects having a substantial effect on metropolitan development which are proposed by any of the localities lying within the jurisdiction of the areawide agency; and (d) review of all applications for loans or grants submitted to the federal government by governmental units lying within its jurisdiction if review by a regional agency is required by federal law or federal agency regulation.

Consideration of alternative goals and programs implies the staff capability to undertake cost-benefit studies and to make certain the programs of various services are coordinated in their delivery. It also suggests sufficient resources to undertake research and analysis of various problems--e.g., consolidation of contiguous or overlapping subregional areas or the examination of the metropolitan tax structure to assure equitable distribution of costs--and to investigate continually the cost-effectiveness of the Metro Council's decisions. In effect, the metropolitan-wide agency would have sole responsibility for looking at the metropolitan area in its entirety.

5. Compatible with Existing Governments

The final administrative criterion which should be considered in establishing an areawide body is its compatibility with existing units of government. The new agency should not duplicate services being performed adequately by existing governmental units, and it should be compatible with our federal system of government.

As has already been mentioned, it is becoming increasingly apparent that many urban services cannot be administered entirely at the local level. On the other hand, there is a rising concern that local governments are too large and that the recipients of governmental services do not have a voice in, or control over, either the quality or quantity of those services which they receive. This stems in part from a rise in real per capital income, the traditional American preference for small local government, and a feeling of powerlessness in dealing with the existing political system. If this trend continues, we can expect efficient service delivery to take a back seat to the citizen's desire for quality services and government responsiveness.

These conflicting forces of centralization and decentralization could be resolved by a two-tier approach to metropolitan government, as recommended by the Committee for Economic Development (CED), in which governmental power is shared between an areawide government and various local governments.[2] While some services would be assigned entirely to the areawide government and others entirely to the local level, the responsibility for most would be shared between the two levels of government. The resultant sharing of powers would mean that the distribution of functions within each service would vary among services, depending upon the ability of the local government in question to meet its responsibilities effectively.

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[2] Committee for Economic Development, Reshaping Government in Metropolitan Areas, A Statement by the CED's Research and Policy Committee (New York, February 1970).

Such a two-tier form of government in an interstate metropolitan area would necessarily require close cooperation among the states involved in the provision of areawide services. In the Washington area this might be achieved by creating three subregional units, representing the metropolitan portion of both states and the District of Columbia, which would possess sufficient authority to manage services directly or to secure them through inter-local contracts with other governmental units. Another approach, and one which would be simpler administratively, although perhaps more difficult politically, would be the establishment through an interstate compact of a tristate, multipurpose district capable of providing metropolitan-wide services.

C. POLITICAL CRITERIA

1. Responsibility for Spectrum of Services

The first political criterion has its roots in no less a document than James Madison's famous Federalist Paper Number 10. Although primarily concerned with avoiding "a tyranny of the majority," Madison argued that the larger the area of government the more pluralistic it would be and the less likely that any one special interest would come to dominate the government. Thus, the interests of the many diverse groups within a community are respected, and action is taken only when a sufficient number of minority interests coalesce to form a majority with respect to a specific issue. Such "floating coalitions" are very unstable, however, and do not lend themselves to the establishment of a permanent majority capable of concerted action on a wide range of issues.

The more diverse the number of issues and interests involved, the wider the area of choice and the more opportunity for tradeoffs among various functional areas. For example, an areawide body in the Washington metropolitan area responsible solely for solid waste disposal would have little leverage in trying to induce suburban communities to accept solid waste from the District of Columbia. On the other hand, if the agency were responsible for metropolitan water supply and sewage treatment services, as well as solid waste disposal, treatment facilities needed to serve the rapidly urbanizing portions of the suburbs could be tied to the provision of sites to alleviate the central city's solid waste problem. Advantages could therefore flow in both directions as each jurisdiction chose from a broad range of projects those which were most responsive to its specific needs--with the benefits accruing to the entire metropolitan area.

In an effort to prevent the spread of single-purpose authorities in metropolitan areas, the Advisory Commission on Intergovernmental Relations has recommended that states authorize local units of government to establish metropolitan service corporations for performance of governmental services requiring an areawide approach.[3] Draft legislation to implement this recommendation empowers the corporation to perform one or more of the following services on a metropolitan basis: (a) comprehensive planning, (b) sewage disposal, (c) water supply, (d) public transportation, (e) garbage disposal, and (f) parks and parkways.

Significantly, most of the above services can be financed entirely by user and service charges. This does not necessarily mean then user charges are the most appropriate means of financing them, particularly if one considers spillover effects and metropolitan disparities in service needs. Nevertheless, charge-supported services may be better candidates than other local services for assignment to an areawide body until that body has demonstrated its effectiveness.

Supporters of multipurpose metropolitan agencies see the inability of the existing governmental structure to meet specific service problems, such as inadequately treated sewage or the inability to guarantee future water supply, as the cutting edge for general-purpose metropolitan agencies. Combine this fact with a capability to provide water supply and waste management services which (a) have the normal advantages of areawide administration, (b) can be financed through user charges, and (c) permit little local variation, and one can readily see the potential integrating force these services could provide a metropolitan area.

Ultimately, the implementation of comprehensive plans and the coordination of water with related aspects of environmental quality would require some degree of zoning authority. Zoning has traditionally been the prerogative and responsibility of local governments, and suggestions to the contrary can be expected to encounter strong opposition. Recent analyses of the only operable federal-interstate compact in the water resources field, the Delaware River Basin Commission, indicate that its inability to exercise effective land-use and zoning control has limited its

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3. ACIR, Government Structure, Organization, and Planning in Metropolitan Areas (July 1961), and ACIR State Legislative Program (August 1969).

ability to formulate and implement a comprehensive range of alternatives in this field.[4]

Attempts to avoid a similar pitfall by giving the proposed Potomac River Basin Commission the authority to designate river zones compatible with river management has run into stiff resistance from both the states and localities involved. Even the new Maryland Environmental Service (MES), as a precondition to Assembly approval, was forced to include in its enabling legislation a section disavowing any intent to alter or restrict the zoning authority or land-use planning authority of any municipality or public instrumentality. Recognizing these difficulties, most administrators would still agree that planning authority without the power to implement it through such tools as zoning and subdivision controls is a weak instrument and not one which is likely to command the respect of local jurisdictions.

2. Public Accessibility and Accountability

Probably the most important political criterion for any democratic government is that those whom it purports to govern should have access to and ultimate control over it. The degree of decentralization, whether by service or function, will have a significant influence on this, as will the method by which members of the governing body are chosen. The two-tier form of government, based as it is upon a sharing of powers between a metropolitan agency and local governments, would also increase the number of access points amenable to citizen pressures.

Within municipalities, a further decentralization may occur with the creation of neighborhood councils which are delegated certain responsibilities based upon their capacity to respond to them effectively. Although significant, this action raises questions, such as the role of the advocate planner and that of neighborhood city halls, which involve a reallocation of responsibilities and power within existing governments and which are beyond the scope of this paper. Suffice it to say that increased decentralization enlarges the span of control of the chief executive and reduces vertical communication problems until it reaches a threshold based upon the chief executive's span of attention and the complexity of the decisions.

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[4] See Paul S. Hughes, Operating Relations Between the Delaware River Basin Commission and Its Signatory Governments: Their Application to the Proposed Potomac River Basin Commission, IDA Note N-752(R), International and Social Studies Division, Institute for Defense Analyses (Arlington, Va., July 1970), pp. 8-13; and Booz, Allen and Hamilton, Inc., Analysis of Managerial, Financial and Regulatory Functions of Regional Water Resources Authorities and Other Institutional Arrangements (Washington, D.C., January 1970), p. 75.

For purposes of this discussion, the method of representation which is used in choosing members of the areawide governing board is more germane.[5] Should they be elected directly, indirectly through constituent units, or appointed? If elected, what should be the basis for election: at-large, single-member districts, or a combination of both? If appointed, who shall do the appointing and on what basis shall he do so?

Most political scientists would agree that if the metropolitan agency is to have powers of taxation, direct election of representatives to the governing body is preferable. However, if the agency is not going to have these powers, direct representation is not necessary. Instead, representation by participating governmental units is acceptable and is more likely, in fact, to engender closer cooperation among the upper and lower tier governments than direct election. Combinations of the two methods are also possible whereby some members are elected directly and others appointed by the constituent governments.

Closely related to the issue of direct election is the question of at-large versus district representation. A range of choices also exists here: (a) all members elected at-large, (b) members required to reside in specific districts but elected at-large, (c) some members elected at-large and others by districts, (d) members nominated in district primaries but elected at-large, or (e) combinations of the above.

With regard to appointment of members to an areawide governing body, particularly one whose responsibilities encompass an interstate metropolitan area, gubernatorial selection is one possibility. This, of course, raises the question of whom the appointees actually represent--the people of the entire state or just those in the metropolitan area? This problem could be overcome by having the two major political parties in the locality submit nominations, based on designated districts, from which the governor would make his selections. In the case of the District of Columbia, the Mayor/Commissioner's hand might be significantly strengthened by designating him as the individual responsible for appointing those who will represent the District on the metropolitan body.

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[5] For additional discussions concerning representation on the governing bodies of metropolitan-wide agencies, see Arthur W. Bromage, Political Representation in Metropolitan Agencies (Ann Arbor: University of Michigan, Institute of Public Administration, 1962); and John C. Bollens and Henry J. Schmandt, The Metropolis: Its People, Politics, and Economic Life (New York: Harper and Row, 1965), pp. 439-47.

Three factors should be borne in mind when appraising alternative means for selecting a metropolitan-wide governing body. First, it is important that there be a relatively small number of highly visible council members whom the voters can directly or indirectly hold accountable for their decisions. Second, direct election itself is no guarantee of accountability, since the methods of structuring the election (e.g., district or at-large representation, long ballot, timing of the elections, their partisan nature, and tenure of office) may dilute the responsibilities of those elected. (These issues are discussed in greater detail below.) And finally, if nurturing metropolitan self-government is believed to be a worthy objective, appointments made by heads of governmental units representing areas larger than the metropolitan area should be avoided.

3. Mechanisms for Citizen Participation

An areawide agency must be able to elicit the active participation of those affected by its decisions. This necessarily implies a population base large enough to provide a pool of interested, knowledgeable, and active citizens whose talents and time can be constructively focused upon the activities of the agency. Although this can perhaps be done most effectively through the two-party system (see below), the agency should devise specific structural mechanisms to enable the public to present its views at a meaningful point in the decision-making process. Previous efforts in this regard, which have not always been a success, have ranged from rubberstamp advisory bodies established to meet legislative requirements (as is often the case in federal urban renewal and poverty programs) to meaningful representation of the private interests affected by the decisions of the areawide agency.

Structural mechanisms and procedures for assuing meaningful public input should include at least four elements:

- A workable method for obtaining and redressing legitimate public complaints regarding the adequacy of service delivery (e.g., neighborhood city halls, complaint centers).

- A means to inform the layman of the legal, technological, financial, and other ramifications of his ideas (e.g., government-paid advocate planners).

- A two-step public hearing process similar to the one now required for federal highway programs, in which hearings are held prior to the location of a particular service corridor and prior to the preliminary design of the highway at that location.

- Continuous public representation, either in an advisory, ex officio, or participatory capacity, on the policy-making body of the agency.

By employing such methods, the citizens are assured of access to the decision-making process and are less inclined to feel threatened by the agency's decisions than if they felt decisions were being made with perfunctory citizen input and behind closed doors.

4. Attract Two-Party Interest

A fourth political criterion is the ability of the metropolitan-wide agency to foster an active two-party interest in its affairs. One of the principal means for achieving this is to consolidate a sufficient amount of power on relevant issues to make it worthwhile for the respective parties to vie for control. This factor was alluded to earlier in the discussion regarding maximization of trade-offs made possible by the agency's responsibility for a spectrum of services. Special-purpose or limited-purpose districts would not, of course, fulfill this requirement. In addition, enough prestige, exposure, and pecuniary incentives must accrue from association with the agency for it to be able to attract the most qualified candidates from both parties. This factor is merely a recognition that no one operates solely for altruistic purposes and that incentives are needed to hold and retain an individual's interest.

From a procedural standpoint, four other considerations are involved: (a) the kind of ballot used in an elective system, e.g., whether partisan or nonpartisan; (b) the timing of the elections or appointments; (c) the length of terms for the seats on the governing board; and (d) whether the seats are filled on an at-large or district basis. A partisan ballot emphasizes party responsibility for decisionmaking in the community, while a nonpartisan one relies primarily on citizen involvement. Citizen involvement is extremely important but to place total reliance on this approach (as opposed to a strong two-party system) to govern an interstate metropolitan area would be to invite disaster.

If we can assume for the moment that an elective system is chosen and that partisan elections are more desirable, the question of timing becomes important. Should the elections be held every two or four years to coincide with national elections, thereby ensuring a good turnout of voters but risking the introduction of extraneous national issues into the metropolitan campaign? Or should the elections be held during off years, which would all but guarantee a small turnouc to vote on strictly local issues? The sheer magnitude of the Washington metropolitan area's demographic, geographic, and locational characteristics means its decisions will be inexorably linked to national issues. The fact that federal funds are required for a multitude of programs means that local government officials who are in step with officials, both elective and appointive, at the federal level would probably be most desirable from the area's standpoint. Thus, if there is agreement that the problems of the Washington metropolitan area are national issues, the value of holding the metropolitan elections during congressional and/or presidential election years--with the accompanying increase in voter participation--seems inescapable.

Another factor to consider is whether the tenure of office is long enough to permit the holders, be they elected or appointed, to gain a good grasp of the problems with which they must work and to settle down to the business of making policy. The two-year term is repeatedly found wanting in this regard, since the incumbent is continually concerned with getting reelected. Therefore, it seems that a four-year term, accompanied by adequate procedures for initiative, referendum, and recall by the voters, would be more conducive to long-range planning and serious policy-making, while at the same time providing ample safeguards against abuse of public office.

With respect to the question of at-large versus district selection, the more parochial viewpoint likely to be gotten from district representation must be weighed against the necessity for having one individual on whom the citizen may focus for a response to his needs. This in turn depends upon the adequacy of citizen grievance and advisory mechanisms referred to in the previous section. One of the prime considerations in establishing an areawide body is that it be able to look at the metropolitan area in its totality. To the extent the public feels its wishes are being met through the regular policy-making and administrative channels, the greater the opportunity there will be for the governing body to focus its attention on areawide concerns.

5. Promote Consensus Among Decisionmakers

The final political criterion may in fact ultimately determine the effectiveness of the metropolitan agency. Unless conditions are created which facilitate consensus on objectives and approaches among members of the agency's decision-making body, the issues requiring strong policy direction will become embroiled in personal and partisan attacks which will preclude the achievement of the agency's goals. To a certain extent this situation will depend on the personalities involved, but steps can be taken to reduce the number of institutional barriers which may exacerbate the situation.

Many factors must be considered in creating an organizational environment which facilitates consensus among its metropolitan representatives. Foremost, perhaps, is the size of the governing body. This in turn hinges on whether the members are elected or appointed and whether they are chosen at-large or by district, with the latter inevitably producing more seats as each identifiable area seeks protection for its interests in the areawide body. Here again, the more the legitimate interests of the public can be structurally accommodated by the organization, the less need there will be for district representation. In that event, representation on an areawide basis will encourage broader perspectives and facilitate compromise and consensus among the officeholders.

Another important factor concerns the degree of institutional security existing for incumbent representatives. This can depend upon the length of their terms in office (with longer terms tending to promote security) and the knowledge that each is supported by one of the two major political parties. (In addition, if members of the governing board are chosen for overlapping terms, a collective wisdom is maintained which prevents a complete breakdown in continuity that a wholesale turnover of incumbents would cause.) Again, with adequate provisions for citizen recall, necessity for having the terms of all officeholders terminate at the same time is no longer required.

Other considerations in the creation of an organizational environment facilitating compromise and consensus are whether the preponderance of the decision-making body's work is done in committees and/or to what extent its deliberations take place behind closed doors. The designation of committees would promote specialization and compromise among its members, but it would also mean that the members' actions would be less visible to the general public. Conducting its business as a committee of the whole, however, might increase visibility at the expense of operational effectiveness. A similar situation also exists for closed versus open meetings.

Concerned, as we are here, with structuring the organization to facilitate compromise among its decisionmakers, the most desirable situation would be one of closed committee meetings which report their findings and recommendations to the full panel. However, unless this body has the confidence of the public (which is most likely to occur if citizen groups are being fully consulted and the areawide agency is responding to their needs as perceived by members of these groups), it will not be allowed to operate in this manner. In the final analysis, the real question is to what extent does the institutional structure provide for advisory consultation with citizens during planning and policy-making periods and respond to their needs.

A final consideration in facilitating consensus is the degree to which all geographic elements of the metropolitan area feel their interests are being adequately represented. Problems in this regard concern the role accorded the central city in the organizational structure and the protection of minority (in the numerical sense) interests. Regarding the former, the ratio of central city/suburban representation will be crucial in determining the acceptance and viability of the metropolitan agency, with the enthusiastic participation of the central city an absolute prerequisite. However, from a population standpoint the central city has been steadily losing ground to the suburbs, while retaining its traditional role as the political, financial, communications, and cultural center of the metropolitan area. One way to compensate for this inequity would be to guarantee the central city a certain percent of the seats on the governing body. Another way may be to strengthen the powers of its mayor by delegating him special appointive or veto powers or stipulating that he shall always serve as head of the metropolitan governing body.

Finally, the protection of minority interests could be facilitated by including one or both of the following provisions: (1) requirement of an extraordinary majority (e.g., two-thirds) for enactment of policy in specified subject areas and (2) selection by districts to assure representation by minority groups who would perhaps go unrepresented in an at-large selection process. Having a two-thirds majority requirement, for instance, would tend to alleviate some of the local governments' fears that a metropolitan-wide agency would ride roughshod over their land-use and zoning prerogatives. However, it would still permit action when a recalcitrant minority was holding up a program which was for the overwhelming betterment of the rest of the metropolitan area.

District selection takes on particular significance when one realizes that an important consideration in the success of several of the recent city-county consolidations in this country has been the fear that black voters would come to dominate the central city. By absorbing the core city, the black vote was diluted and white domination was ensured.[6] If this feeling is widespread, it is conceivable that a metropolitan-wide majority could include a core city in an areawide government against its wishes. In the Washington metropolitan area, however, because of the unique relationship between the District of Columbia and the federal government, a new governmental arrangement would have to be made sufficiently attractive to the central city residents and to Congress before its inclusion in an areawide body would be possible. Although the wishes of the District of Columbia residents and those of Congress are not always synonomous, it seems likely that both would want some type of guaranteed representation for the District on any newly created metropolitan-wide body. Therefore, even though there may be a tendency on the part of the suburbs to dilute central city representation, the District appears to have a unique opportunity to join such a union on its own terms.

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[6] See Committee for Economic Development, Reshaping Government in Metropolitan Areas, A Statement by CED's Research and Policy Committee (New York, February 1970), p. 60; and "Indianapolis Suburbanites Find Cause to Cheer Merger," The Washington Post, September 8, 1970, p. 2.

Appendix C

LIST OF PERSONS CONTACTED

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The following persons were contacted in connection with this study. All were helpful in providing information and/or criticism at critical stages in the development of this paper, but in no way does their inclusion in this list imply endorsement of the views contained herein.

Thomas E. Adams, Legislative Assistant, Congressman Joel T. Broyhill's Office

Thomas C. Andrews, Natural Resources Planner, Maryland Department of Natural Resources

William M. Colony, Director, Planning and Evaluation Office, Charlottesville Regional Water Quality Office, Environmental Protection Agency

Robert T. Dennis, Executive Director, Potomac Basin Center

Marvin Fast, Division of State and Local Programs, Water Quality Office, Environmental Protection Agency

Herbert Fuchs, Counsel, House Judiciary Committee

Walter Gilbert, Regional Coordinator for the Potomac Basin, Water Quality Office, Environmental Protection Agency

Bernard Gross, Executive Director, Northern Virginia Planning District

Edwin T. Haefele, Senior Research Associate, Resources for the Future, Inc.

Carl Johnson, Executive Director, Interstate Commission on the Potomac River Basin

Carolyn Johnson, Legislative Assistant, Senator Charles McC. Mathias' Staff

John J. Lentz, Director of Health and Environmental Protection, Metropolitan Washington Council of Governments

Reed W. McDonagh, Deputy Director, Maryland Environmental Service

Roy L. Orndorff, Executive Secretary, Potomac River Basin Advisory Committee

James H. Pickford, Senior Analyst, Advisory Commission on Intergovernmental Relations

Appendix D

GLOSSARY

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ACIR	Advisory Commission on Intergovernmental Relations
CED	Committee for Economic Development
EPA	Environmental Protection Agency
FWQO	Federal Water Quality Office
HUD	Department of Housing & Urban Development
INCOPOT	Interstate Commission on the Potomac River Basin
MES	Maryland Environmental Service
MWCOG	Metropolitan Washington Council of Governments
MWWMA	Metropolitan Washington Waste Management Agency
PRBC	Potomac River Basin Commission
TVA	Tennessee Valley Authority
WRC	Water Resources Council

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